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Bureau of Land Management**

**Ely Field Office  
Ely, Nevada**

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# **Draft – Volume 2 (Chapters 4, 5, and 6) Resource Management Plan / Environmental Impact Statement for the Ely District**



**COOPERATING AGENCIES:**

Duckwater Shoshone Tribe  
Ely Shoshone Tribe  
Great Basin National Park  
Humboldt-Toiyabe National Forest  
Lincoln County  
Moapa Band of Paiutes  
Nellis Air Force Base

Nevada Division of Minerals  
Nevada Division of Transportation  
Nevada Department of Wildlife  
Nevada State Historic Preservation Office  
Nye County  
White Pine County  
Yomba Shoshone Tribe



*BLM Mission Statement*

*It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.*

BLM/EL/PL-05/019+1610

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## 4.0 ENVIRONMENTAL CONSEQUENCES

### How to Read Chapter 4.0

Chapter 4.0 presents the likely impacts to the natural and human environments from the implementation of the alternatives presented in Chapter 2.0. The basic organization of Chapter 4.0 follows the categories and subcategories that have been used throughout this RMP/EIS, with five alternatives discussed under each. The chapter contains the following major components:

- Introduction – including types of effects to be addressed, BLM's critical elements of the human environment, assumptions for analysis, and incomplete and unavailable information.
- Impacts by category – including impact issues, assumptions, interactions with other programs, and impacts for each management goal by alternative.
- Cumulative impacts – including assumptions, interrelated projects, and impacts by category.
- Potential mitigation and monitoring.
- Unavoidable adverse environmental effects.
- Several other required sections as detailed in the table of contents.

The tools and techniques that are presented in Appendix E could be utilized by the Ely Field Office regardless of which alternative is selected (common to all alternatives). Therefore, the environmental effects of these tools and techniques are discussed at the beginning of each resource program that could be affected by their use. The first section of this discussion looks at the tools and techniques that could be used for vegetation treatment. This is followed by those that could be used to achieve other management goals. Since the tools and techniques are so numerous, they have been grouped into categories that would have similar effects (e.g., mechanical treatment, chemical treatment). These categories and the tools and techniques that have been included in each are presented in Appendix E.

The paragraph summarizing interactions with other programs at the beginning of each section indicates which resource programs may interact with the program that is the topic of the section. If no interaction is indicated, the other program will not be discussed further in the section. The discussion of impacts for each alternative begins with the program specific impacts; e.g., what impacts would the wildlife management direction have on wildlife. This is followed by a discussion of the interactions between the management direction for other programs and the topic of the section; e.g., what impacts would mineral development have on wildlife. In reading each section, it is important to maintain a clear understanding of the direction of the interaction analyses; i.e., how do other programs affect the program being considered, not how does the program being considered affect other programs.



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Since standard operating procedures and other mitigating measures have been incorporated into the basic structure of the alternatives, many potential impacts have been reduced or eliminated “up front.” For ease of reading, analysis that is presented for Alternative A may be referenced in following alternatives with such statements as “impacts would be the same as (or similar to) Alternative A” or “impacts would be the same as Alternative A except for ...,” as applicable.

All maps referenced in Chapter 4.0 are presented in the separate Map Volume.

### 4.1 Introduction

This chapter describes the environmental consequences that would result from the implementation of the management direction contained in the No Action Alternative, and the four action alternatives, including the Proposed Action. The analysis of impacts associated with the alternatives is required by BLM planning regulations and by the Council on Environmental Quality Regulations for implementing NEPA. The analysis presents best estimates of impacts. When quantitative information is available (frequently through geographic information system analysis), numerical values or ranges are presented. However, since many of the management directions presented for the alternatives are programmatic in nature, impacts are frequently described in qualitative terms, relying on best professional judgement. Impact analyses and conclusions are based on interdisciplinary team knowledge of the resources and conditions within the District, information collected by BLM and other agency resource specialists, and published and unpublished literature, including information available on internet web sites. Chapter 3.0 presents the characteristics of the affected environment that were considered during impact analysis. Assumptions for analysis also have been developed to facilitate impact analysis (see Section 4.1.3). The five alternatives considered in detail are summarized below.

#### Alternative A

Alternative A is the continuation of existing management on the Ely District, also called the “No Action Alternative” under NEPA regulations. This alternative would continue present management practices based on existing land use plans and other management decision documents. Valid decisions contained in the Egan RMP, the Egan RMP Oil and Gas amendment, the Schell and Caliente MFP, and the Caliente MFP Desert Tortoise Amendment would be implemented if not already completed. Direction contained in existing laws, regulation, and policy also would continue to be implemented, sometimes superseding provisions of the Egan RMP and Schell and Caliente MFPs. Resources, resource uses, and sensitive habitats would receive management emphasis at present levels. Restoration of ecological systems would utilize either active or passive methods, and would be implemented primarily in reaction to changes that occur from events such as fire or other disturbances. Restoration activities would be conducted on approximately 10,000 acres per year. Increases in herbaceous vegetation resulting from restoration would be allocated to livestock and wild horses as directed in the existing plans. Vegetation communities would be managed to achieve appropriate composition of woody and herbaceous species that promote resiliency. This would involve a mosaic of vegetation communities having differing ages (since treatment) and differing composition and structure. The current levels, methods, and mix of multiple use management of public land would receive attention at present levels. The three ACECs designated in the Desert Tortoise Amendment



would be retained. In general, most activities would be analyzed on a case-by-case basis, and few uses would be limited or excluded as long as land health standards could be met. Off-highway vehicle use would remain relatively unrestricted throughout the District; there would be no recreation management areas with an emphasis on off-highway vehicle use of designated roads and trails. Fire management would continue under the existing Ely District Managed and Natural Prescribed Fire Plan, which provides for the beneficial use of fire in selected situations.

### **Alternative B**

Alternative B would emphasize the maintenance of those systems that are functioning and healthy and the restoration of ecological systems and their historic mosaic patterns that have been degraded or altered. There would be a coordinated effort to restore the resiliency of native vegetation in shrub communities, woodlands, and riparian areas. Commodity production would be constrained to protect resources and systems that display healthy ecological processes or to accelerate improvement in those areas that do not. Production of food, fiber, minerals, and services would be more constrained than in the other alternatives, and in some cases and some areas, uses would be excluded to protect sensitive resources. Restoration would utilize either active or passive methods, and would be implemented proactively to build resiliency and resistance to changes that would degrade natural systems. Restoration activities would be accelerated in comparison to Alternative A and limited by available funding and resources. Increases in herbaceous vegetation resulting from restoration would be allocated for watershed maintenance and wildlife. Sagebrush communities would be managed to achieve a mosaic of herbaceous/shrub phases with minimal bare ground; interspaces between shrubs would be occupied by perennial grasses and forbs. The three ACECs designated in the Desert Tortoise Amendment would be retained, and 18 new ACECs also would be designated. Under this alternative, management would more often be applied across several vegetation types with a restoration emphasis on those areas most at risk of crossing a threshold into a less desirable vegetative community or ecological process, rather than focusing on specific sensitive resources in particular geographic areas. Off-highway vehicle use would be restricted to designated roads and trails; recreation management on approximately 310,000 acres would emphasize off-highway vehicle use of designated roads and trails. Fire use would be implemented to the greatest extent possible as a vegetation treatment tool following watershed analysis.

### **Alternative C**

Alternative C would emphasize commodity production and production of food, fiber, minerals, and services, including provisions for several types of recreation. Under this alternative, constraints on commodity production for the protection of sensitive resources would be the least restrictive possible within the limits defined by law, regulation, and BLM policy, including the Endangered Species Act, cultural resource protection laws, and wetland preservation. In this alternative, constraints to protect sensitive resources would tend to be implemented in specified geographic areas rather than across the planning area. Active and organized recreation activities (such as off-highway vehicle use and races) would be emphasized in this alternative. Restoration of ecological systems would utilize either active or passive methods. Restoration activities would be accelerated in comparison to Alternative A and limited by available funding and resources. Increases in herbaceous vegetation resulting from restoration would be allocated to livestock.



## **4.0 ENVIRONMENTAL CONSEQUENCES**

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Land health restoration activities would focus on areas with understory vegetation appropriate for the ecological site, which could provide the production of additional forage. Sagebrush communities would be managed to achieve sites dominated by herbaceous vegetation (i.e., grasses) with some shrubs. The three ACECs designated in the Desert Tortoise Amendment would be retained, and 20 new ACECs also would be designated. Off-highway vehicle use would be restricted to designated roads and trails; recreation management on approximately 734,000 acres would emphasize off-highway vehicle use of designated roads and trails. All wildland fires would be suppressed and prescribed fires would be used only in limited situations as a vegetation treatment tool.

### **Alternative D**

Alternative D would exclude all permitted, discretionary uses of the public lands including livestock grazing, mineral sale or leasing, lands and realty actions (such as disposals, leases, rights-of-way), recreation uses requiring permits, etc. The Ely Field Office would petition the Department of the Interior to withdraw a majority of the planning area from locatable mineral entry. This alternative would allow no commodity production and would include management actions necessary to maintain or enhance resources and protect life and property. Any management actions would utilize primarily passive methods. Active restoration would be restricted to previously treated areas (such as chainings and seedings), areas dominated by invasive species, and newly disturbed areas (such as those resulting from wild fires). Restoration activities would be focused toward a much narrower set of conditions than in Alternatives B and C. Such restoration would be primarily in reaction to changing conditions. Increases in herbaceous vegetation resulting from restoration would be allocated for watershed maintenance, wildlife, and wild horses. Sagebrush communities would be managed to protect existing native communities and to prevent expansion of annual exotic species. No ACECs would be retained or designated. Off-highway vehicle use would be restricted to maintained roads. Some components of the alternative may not be possible to implement because of legal constraints, but the alternative is included for purposes of impact comparison. Wildland fires would not be suppressed unless they are human-caused or threaten life or property.

### **Alternative E**

Alternative E is the Ely Field Office's proposed action, and represents a shift from a commodity or individual resource allocation approach to a holistic or ecological systems approach to management. This alternative emphasizes improvement in ecological conditions and a high level of natural resource protection created by managing natural and manmade disturbances to avoid crossing thresholds while also providing for resource uses. This alternative would balance the need to restore, enhance, and protect resources with the public's desire to provide for the production of food, fiber, minerals, and services on public lands. This would be done within the limits of an ecological system's ability to sustainably provide these products and services within the constraints of various laws and regulations. Restoration would utilize either active or passive methods, and would be implemented proactively to build resiliency to prevent further degradation of ecological systems. Restoration activities would be accelerated in comparison to Alternative A and limited by available funding and resources. Increases in herbaceous vegetation resulting from restoration would be allocated in a balanced approach for watershed, wildlife, livestock, and wild horses. Sagebrush communities would be managed to achieve a variety (mosaic) of phases (age classes) of sagebrush types with emphasis



on shrub/herbaceous communities. Vegetation resources and fish and wildlife habitats would be restored and enhanced using a variety of tools, but to a lesser extent than Alternative B. However, constraints to protect sensitive resources could be implemented in specified geographic areas. The three ACECs designated in the Desert Tortoise Amendment would be retained, and 18 new ACECs also would be designated. Off-highway vehicle use would be restricted to designated roads and trails; recreation management on approximately 734,000 acres would emphasize off-highway vehicle use of designated roads and trails. Fire use would be implemented to the greatest extent possible as a vegetation treatment tool following watershed analysis.

#### **4.1.1 Types of Effects to be Addressed**

As specified in the Council on Environmental Quality guidelines for implementing the National Environmental Policy Act contained in the Code of Federal Regulations, three types of effects are discussed in this EIS and each is described below.

- “Direct effects, which are caused by the action and occur at the same time and place.” (40 Code of Federal Regulations 1508.8).
- “Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.” (40 Code of Federal Regulations 1508.8).
- “Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” (40 Code of Federal Regulations 1508.7).

The impact discussion is subdivided by resource, resource use, and resource program, but not all of these subdivisions will be subject to each type of impact. Potential mitigation and monitoring and unavoidable adverse environmental effects are discussed at the end of the chapter.

#### **4.1.2 Summarize Critical Elements of the Human Environment**

The BLM's NEPA Handbook (H-1790-1) requires that all EISs address certain Critical Elements of the Human Environment. The list of elements contained in the handbook has been expanded by BLM Instruction Memoranda and Executive Orders. These critical elements are presented below along with the location in this chapter where the element is discussed. If the element does not occur within the Ely District, or if it occurs, but would not be affected by the management direction being analyzed, this is indicated below and the element is not discussed further in the EIS. This elimination of non-relevant issues follows the Council on Environmental Quality guidelines as stated in 40 Code of Federal Regulations 1500.4.



## 4.0 ENVIRONMENTAL CONSEQUENCES

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From BLM NEPA Handbook (H-1790-1):

- Air Quality – Section 4.2
- Areas of Critical Environmental Concern – Section 4.22
- Cultural Resources – Section 4.9
- Farm Lands (prime or unique) – No prime or unique farmlands occur on the District; however, two soils classified as prime with limitations occur to a limited extent within the District. These soils are not used for production agriculture within the District.
- Floodplains – Section 4.3
- American Indian Religious Concerns – Section 4.25
- Threatened or Endangered Species – Section 4.7
- Wastes, Hazardous or Solid – Section 4.27
- Water Quality (Surface and Ground) – Section 4.3
- Wetland/Riparian Zones – Section 4.5
- Wild and Scenic Rivers – No designated Wild and Scenic Rivers or rivers with wild and scenic characteristics occur within the Ely District.
- Wilderness – Section 4.22

Added subsequent to Handbook:

- Wild Horses – Section 4.8
- Wild Horse Range – No areas within the Ely District meet this designation.
- Paleontological Resources – Section 4.10
- Environmental Justice – Section 4.26
- Invasive, Nonnative Species – Section 4.21
- Migratory Birds – Section 4.6
- Statement of Adverse Energy Impact – Section 4.36

### 4.1.3 Assumptions for Analysis

Where specific information is not available for a resource program, it is necessary to formulate reasonable assumptions with which to conduct the impact analyses. General assumptions are presented below, while program-specific assumptions are presented at the beginning of each subsection. These assumptions should not be interpreted as constraining or redefining the management direction described for each alternative in Chapter 2.0.

- Existing state and federal environmental legislation and regulatory programs would remain relatively unchanged and in effect (i.e., analyses are based on current, rather than projected, future regulations).
- For purposes of the EIS analysis, the underlying assumption is that the successful application of treatments developed for a specific watershed would, at a minimum, result in the maintenance or



establishment of the desired vegetation species in approximately the desired proportions, thus, increasing vegetation resilience beyond that existing prior to the treatment.

- Applications for possible land disposal under the provisions of this RMP would be subject to site-specific review. No project-specific assumptions as to the ultimate use of any specific parcel of land that may be disposed of, the amount of surface disturbance involved, or water development associated with future land use have been made as part of the analysis in this EIS. Such assumptions have been made for interrelated projects that are considered in the cumulative impact analysis (Section 4.28).
- In areas that have been identified for possible land disposal, the Ely Field Office would continue management of all resources until title has been transferred on a selected parcel.
- The development of lands associated with the Lincoln County Land Act and the Lincoln County Conservation, Recreation, and Development Act are not included as part of the No Action Alternative or action alternatives; however, they are included in the discussion of cumulative impacts found in Section 4.28.
- For impact analyses, short term is generally defined as being less than 10 years and long term as being greater than 10 years unless otherwise noted for a specific resource. Each resource would explain the differences in impacts within these periods as appropriate. The short-term period may be less than 10 years if a resource being managed would respond in less time (such as specific treatments for wildlife species or their habitats). The length of the long-term period also could vary by resource. For example, recreation may need to discuss impacts out to 20 years, while vegetation may need to discuss impacts out to 50 to 100 years.

#### **4.1.4 Incomplete and Unavailable Information**

The best available information pertinent to the decisions to be made in the Ely District RMP/EIS was used to develop and evaluate alternatives. As is always the case when developing management direction for a wide range of resources, not all information that might be desired was available. The discussions below highlight the areas where information is incomplete or unavailable and the approach taken to allow impact analysis to proceed based on the information that is available. The primary effect of unavailable information is the inability to quantify certain impacts. Where quantification was not possible, impacts have been described in qualitative terms. The Council on Environmental Quality Regulations provide direction on how to proceed with the preparation of an EIS when information is incomplete or unavailable:

“If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement: 1) a statement that such information is incomplete or unavailable; 2) a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; 3) a summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and 4) the agency’s evaluation of such impacts based upon theoretical



## 4.0 ENVIRONMENTAL CONSEQUENCES

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approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts which have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason." (40 Code of Federal Regulations 1502.22 b).

### 4.1.4.1 Vegetation Treatment and Watershed Management

- Incomplete Information – Certain descriptive information for vegetation on the District, which relates to watershed management, is incomplete and unavailable. Key items within the information that are incomplete are soil surveys for about 1.1 million acres of the District and existing vegetation composition and resiliency in the various Great Basin and Mojave Desert vegetation communities. This information is collected as part of the watershed analysis process. In addition, fire history of various vegetation types in the Great Basin has not been thoroughly researched, and the research base and associated information regarding appropriate restoration methods for certain vegetation types, such as winterfat vegetation communities, are weak or lacking. Most of the applicable

**RMP Management Focus**

*The restoration and maintenance of healthy ecological systems within watersheds is a primary focus for the future management of the Ely District. Healthy ecological systems are geographically diverse and change over time. They are compatible with soil potential and are resilient to disturbance.*

*Resources and resource uses will be managed to restore or maintain ecological health. Certain resource management changes and active treatments may need to be implemented, in portions of watersheds, to accomplish this objective. Adaptive management will be pursued to avoid deteriorating conditions favoring invasive plants and catastrophic fires. Any projects will be implemented so as to result in a mosaic of vegetation within a watershed.*

*In the long-term, natural disturbance (such as drought or fire) will occur and fewer treatments will be needed to maintain ecological health. The result will be a variety of vegetation phases within a watershed, which will provide diverse, healthy conditions for future generations.*

- research data relates to conversion of various native communities, particularly sagebrush and pinyon-juniper, to seeded grasslands rather than to restoration of native shrub communities.
- Relevance of Incomplete Information – It would be necessary to treat portions of the vegetation in each watershed to restore resiliency. The incomplete information relates to the number of acres that would need to be treated for each vegetation type and the tools and techniques that would be used for treatment, based primarily on topography and resource objectives. Selection of appropriate tools and techniques for individual treatment situations would be based on the available knowledge at that time. This knowledge base would continue to grow, leading to improved treatment success, through and beyond the life of this plan.
- Summary of Existing Information – Of the 61 watershed management units that exist on the District, watershed analyses are being conducted for nine. The remaining high-priority watersheds will be



analyzed over the next 10 years. The major impediment to completing watershed analyses is the lack of detailed soils information that is collected by the Natural Resources Conservation Service. Staff availability limits the number of acres the Natural Resources Conservation Service can survey each year.

- **Approach to Evaluate Impacts** – BLM extrapolated the characteristics of and management actions for the entire District (excluding the Mojave Desert portion of the District) from assessment data that are available for three watersheds and Gap Analysis Program vegetation data. Extrapolating characteristics of a large area from a smaller subset is a commonly accepted practice in landscape analysis, and this approach has allowed BLM to analyze the effects of watershed treatment on the various resources and uses that are present in the District. Further, many specific management decisions would be made using watershed analysis information. Each watershed analysis would address issues such as the interaction of watershed conditions and suggested treatments with livestock grazing, wild horses, sensitive species, cultural resources, mineral development, recreation, and road/trail closure. Watershed specific assessments would be conducted during the watershed analysis process, and the information will be used to make project-level (site-specific) management decisions. It is anticipated that an environmental assessment would be prepared for site-specific decisions stemming from watershed analyses. In addition, ongoing watershed analyses across the District would continue to update and refine data available for use in implementing this RMP.
- **Conclusion** – The incomplete vegetation and watershed information for the entire 11.4 million acres of the planning area could not be obtained within a reasonable timeframe, estimated at 20 years given current funding levels, without an exorbitant cost.

#### **4.1.4.2 Condition of Vegetation Communities**

- **Incomplete Information** – While it is generally accepted by the scientific community that some vegetation conditions in the Great Basin are deteriorating (including reduction of species diversity, loss of perennial understory grass and forb species, increase in abundance of invasive annual species, and/or increased density of wood species), quantitative information on the rate of this deterioration, especially within the Ely District, is not available. While much is known about the general situation, much additional inventory, assessment, monitoring, and research is needed to gain greater certainty about specific watersheds and areas, as well as the effectiveness of some management treatments.
- **Relevance of Incomplete Information** – The rate of change in vegetation communities would have a direct bearing on the rate of vegetation treatment that would be necessary in order to prevent or reverse undesirable changes.
- **Summary of Existing Information** – Information on vegetation condition and trends is presented in Sections 3.5 and 3.19, and in **Table 2.4-1**. Some general information exists on the rate of vegetation deterioration or improvement; for example, pinyon-juniper expansion removes most of the understory shrubs in four to five decades after the tree seedlings become established. Once invasive weed populations become established in small areas, they can increase so quickly that they can become



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economically or ecologically beyond eradication within a few years. Once incised riparian areas expand their gully walls to more than a few channel widths apart, they can recover functionality within a few years.

- Approach to Evaluate Impacts – The influence of change in vegetation communities has been incorporated into impact analysis based on the number of acres within the Ely District that require some type of vegetation treatment over the next 20 to 50 years. It has been assumed that change will continue in the absence of intervention, without specifying a rate. Therefore, for plant community health attributes that are fire dependent, the normal fire return interval provides guidance (see **Table 3.20-2**).
- Conclusion – The deterioration of vegetation communities on the Ely District is a long-term process that has been ongoing for several decades and is likely to continue for many additional years or decades. The cost to obtain the incomplete information on the rate of deterioration of vegetation communities over the 11.4 million acres of the Ely District during the RMP preparation would be exorbitant.

### 4.1.4.3 State and Transition Models

- Incomplete Information – State and transition models are an important part of the watershed analyses that would be conducted as part of the management of the Ely District. However, models have not been completed for all the vegetation types (ecological sites) found on the District.
- Relevance of Incomplete Information – State and transition models and their associated vegetation thresholds are helpful in evaluating data collected to assess the condition of watersheds and to help identify the appropriate types of treatments required to maintain or return a watershed to ecological health. The condition of vegetation communities discussed in the preceding section used in conjunction with the appropriate models would be used to identify the areas to be treated within a watershed.
- Summary of Existing Information – Generalized draft working models are available for major key vegetation types within the District including Wyoming big sagebrush, black sagebrush, mountain big sagebrush, winterfat, shadscale, curlleaf mountain mahogany, and pinyon-juniper forestland ecological sites.
- Approach to Evaluate Impacts – In the absence of output from a complete set of models, the Ely Field Office has estimated the number of acres (by major vegetation type) that would need to be treated across the District and discussed the general types of treatment that may be appropriate. These estimates would be refined as additional data and models become available.
- Conclusion – State and transition models currently are being developed for the ecological sites found on the Ely District by parties outside the BLM. Even if it were possible to accelerate the preparation of these models, the cost to complete all the models during the RMP/EIS preparation would be exorbitant.



#### 4.1.4.4 Bighorn Sheep and Domestic Sheep Interactions

- Incomplete Information – Detailed information on the transference of disease from domestic sheep to bighorn sheep is a matter of debate among wildlife specialists, game management agencies, and the livestock industry.
- Relevance of Incomplete Information – Information on possible disease vectors within bighorn sheep populations would be necessary to develop adequate protection for bighorn sheep populations and their habitats (e.g., occupied and historic ranges, and migration corridors).
- Summary of Existing Information – Approximately 1.2 million acres of Rocky Mountain bighorn sheep and desert bighorn sheep habitat (occupied and historic ranges, and migration corridors) occurs within existing domestic sheep and goat grazing allotments. It has been reported from past studies that domestic sheep may have been the main vector of disease transference to bighorn sheep, which resulted in the decimation of bighorn sheep populations in isolated areas of the western U.S. However, in Nevada, large scale historical declines from scabies mite (*Psoroptes* sp.) is conjectural. No reports of sheep dying from scabies in Nevada has been confirmed. As a result, the specific effect of scabies on historic sheep populations in Nevada is unknown (Nevada Department of Wildlife 1978).
- Approach to Evaluate Impacts – The BLM believes that the preponderance of evidence indicates a negative interaction between bighorn sheep and domestic sheep. Even though there is debate on this issue and additional research is ongoing, management direction and impact analysis contained in this RMP/EIS is based on the potential for conflicts between the species. Since domestic sheep utilize similar resources to bighorn sheep within the District, and because domestic sheep may be a primary disease vector to bighorn sheep populations on the District, exclusion of livestock (i.e., domestic sheep and goats) from occupied and historic ranges of bighorn sheep would improve overall health of bighorn sheep populations and habitat quality for bighorn sheep populations on the District.
- Conclusion – The cost to identify and characterize disease vectors within bighorn sheep populations on the Ely District during the RMP/EIS preparation would be exorbitant.

#### 4.1.4.5 Special Status Species

- Incomplete Information – Detailed inventories have not been conducted to establish the location, population size, population trends, and factors affecting any of the special status plant and animal species that may occur on the Ely District. Limited information regarding special status plant species is available through the Nevada Natural Heritage Program.
- Relevance of Incomplete Information – Population information is necessary for developing desired future conditions for some sensitive species and then assessing impacts based on these desired future conditions.



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- **Summary of Existing Information** – Limited information is available on some species and almost no information is available on others. The Nevada Natural Heritage Program has information on certain special status plants but not animals. The special status species for which the greatest amount of information has been collected is the greater sage-grouse. This has allowed BLM to prepare a desired future condition for this species, which is presented in Appendix M.
- **Approach to Evaluate Impacts** – The desired future condition for sage grouse would be used as a model for the desired future condition for other special status species. Impact analysis is based on the assumption that habitat and population data would be collected and a desired future condition prepared before vegetation treatment proceeds in areas that contain special status species, especially those species for which knowledge about habitat is needed.
- **Conclusion** – Approximately 158 special status species could occur on the Ely District (see Appendix F). The cost to collect population data on 158 species over the 11.4 million acres of the Ely District during the RMP/EIS preparation would be exorbitant.

### **4.1.4.6 Paleontological Sites**

- **Incomplete Information** – Detailed inventories to locate all significant paleontological sites that may occur on the Ely District have not been conducted.
- **Relevance of Incomplete Information** – Site location and significance information is necessary for identifying conflicts between paleontological sites and the management and use of other resources.
- **Summary of Existing Information** – Information on previously identified paleontological sites is presented in Section 3.10. There are relatively few significant sites identified on the Ely District.
- **Approach to Evaluate Impacts** – Impacts were evaluated based on the location and quality of known sites. Management direction would apply to newly discovered sites as well as known sites. Therefore, impacts to known sites are a good measure of potential impacts to unknown sites.
- **Conclusion** – The cost to collect location and significance information for paleontological sites on 11.4 million acres of the Ely District during the RMP/EIS preparation would be exorbitant.

### **4.1.4.7 Historic Fire Return Intervals – Riparian**

- **Incomplete Information** – Data on the historic fire return interval for the riparian vegetation community is not available.
- **Relevance of Incomplete Information** – The plants that occur in riparian areas are typically less susceptible to the start of fires, and the linear nature of many riparian areas does not facilitate the propagation of fires. Fires occur in riparian areas with less frequency and are less severe than fires in drier upland areas on the District.



- Summary of Existing Information – Historic fire return intervals for vegetation communities on the Ely District are discussed in Sections 3.20.1 and 3.20.2. Intervals range from about 20 to 200 years, depending on vegetation type.
- Approach to Evaluate Impacts – Due to the lower probability of fires in riparian areas, impact analysis was based on fire return intervals for upland areas where data are available.
- Conclusion – Fire return intervals are based on historic data that have not been recorded for riparian areas. Thus, there is no means to obtain these data.

#### **4.1.4.8 Contaminated Sites**

- Incomplete Information – There is the potential that contaminated sites associated with mining, landfills, illegal dumping, and drug labs exist on the Ely District where a threat to human health has not yet been characterized.
- Relevance of Incomplete Information – Contaminated sites are handled by the Ely Field Office as a hazard or health risk when identified, according to the requirements of existing laws and policies. Thus, until a site is identified, no action can be taken.
- Summary of Existing Information – Two contaminated sites are currently being managed on the Ely District (see Section 3.26).
- Approach to Evaluate Impacts – Since all contaminated sites are managed according to the existing laws and policies, impacts associated with the management of known sites are a good measure of potential impacts associated with unknown sites.
- Conclusion – The cost to identify and characterize contaminated sites over the 11.4 million acres of the Ely District during the RMP/EIS preparation would be exorbitant.

#### **4.1.4.9 Interrelated Projects**

- Incomplete Information – An extensive list of interrelated projects has been assembled for consideration in the cumulative impacts analysis (see Section 4.28, **Table 4.28-1**). In an attempt to make the list as comprehensive as possible, five reasonably foreseeable future actions (Lincoln County Land Act development; actions under the Lincoln County Conservation, Recreation, and Development Act; water development in White Pine County; water development in Lincoln County; and Coyote Springs residential development) were included for which there is limited information. The unavailable information relates to ongoing water demand and permanent employment for the projects.
- Relevance of Incomplete Information – The unavailable information is relevant to the cumulative impacts to groundwater resources and economic growth in the counties that make up the Ely District.



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- **Summary of Existing Information** – While these projects are in the discussion stage, no specific development plans have been prepared. The projects were included in the list to capture their anticipated surface disturbance, but specific information on water demand and employment does not exist. Because advancement of the projects requires decisions or actions by entities outside BLM, including private developers and the Nevada State Engineer, BLM knows of no means to obtain the unavailable information.
- **Approach to Evaluate Impacts** – The basic approach to the cumulative impacts analysis was to establish an order of magnitude for the impacts of the interrelated projects on air emissions, surface disturbance, water demand, and employment. It is believed that the unavailable information on water demand and employment would not substantially increase the totals for these two categories (about 400,000 acre-feet per year and 1,500 employees, respectively). Therefore, cumulative impact analysis proceeded without the information.
- **Conclusion** – Since many of the interrelated projects are in the early planning stage and projects may not be at the permitting stage for 2 to 5 years, there is no means to obtain detailed project description information from the outside parties.

### 4.1.5 Comparison of Impacts by Alternative

**Table 4.1-1**, which follows, presents a comparative summary of the primary impacts to each resource program for each of the five alternatives analyzed in detail in Chapter 4.0. The detailed discussion of impacts begins in Section 4.2.



Table 4.1-1  
Summary Comparison of Impacts

<b>CLIMATE AND AIR QUALITY</b>	
<b>Goal – Meet all applicable local, state, Tribal, and National Ambient Air Quality Standards under the Clean Air Act (as amended), and prevent significant deterioration of air quality within the Ely District from all direct and authorized actions.</b>	
Alternative A	Air quality in the District is largely impacted by fire management decisions. Short-term impacts of fugitive dust from recreational events also can impact air quality. The existing Ely District Managed Natural and Prescribed Fire Plan would continue to be implemented with decisions regarding individual fires based in part on determination of where in the District fire would be beneficial and where it may be detrimental. Unplanned fires tend to burn hotter and longer than controlled burns resulting in more emissions and potentially worse air quality.
Alternative B	This alternative would likely result in more small fires and fewer major fires, and may improve air quality in the District.
Alternative C	In the short term, air quality impacts from fire could be lessened over the present. In the long term, air quality is likely to be impacted by greater numbers of large-scale fires producing more emissions.
Alternative D	Air quality would be impacted in both the short term and long term by an increased probability for occurrence of large-scale fire events.
Alternative E	Alternative E would be similar to Alternative B, in which fire would be used as a tool in vegetation management to the greatest extent possible. This approach would likely result in more small fires and fewer major fires, and may improve air quality in the District compared to Alternative A.
<b>WATER RESOURCES</b>	
<b>Goal – Restore and maintain the chemical, physical, and biological integrity of the waters in the Ely District to maintain healthy ecological systems while sustaining multiple uses.</b>	
Alternative A	Since restoration currently does not keep pace with the decline in ecological trends, groundwater recharge and seasonal surface water flows would be expected to decline. Shorter term runoff events (e.g., thunderstorms, snowmelt) would continue to exhibit their current timing and volume, or may occur over shorter time scales and with somewhat larger volumes in watersheds where conditions continue to degrade. Water quality would continue to decline under Alternative A. Evapotranspiration consumption would be expected to increase.
Alternative B	Water resources would improve under Alternative B because watershed analysis and restoration would take place at an accelerated rate. Localized, short-term increases in erosion and sedimentation may occur immediately following vegetation treatments. Such effects would be minimized by the implementation of best management practices during the treatment process.
Alternative C	In general, long-term improvements in water quality and water resources availability for uses would occur as a result of intensive vegetation management under Alternative C. Increases in water availability (mainly springflows and baseflows) would occur in areas conducive to groundwater recharge and discharge. Water usage and water quality degradation may occur in some areas as a result of increased recreational developments. Over the long term, these effects would be combined with rapid runoff, increased flooding, and greater sediment yield encouraged by the fire suppression approach under this alternative.
Alternative D	In general, improvements in water quality and water resources availability for uses would not be extensive as a result of management under Alternative D. Small increases in water availability, primarily in limited areas conducive to groundwater recharge and discharge, would occur. Water quality improvements would occur as a result of recreation and livestock management approaches. Over the long term, however, these improvements would be overshadowed by the fire management approach under this alternative, which would ultimately encourage rapid runoff, flooding, and sediment yield.
Alternative E	Water resources would be improved on a long-term basis as individual watersheds are analyzed and treated to restore vegetation resiliency. During the short term, localized increases in erosion and sedimentation may occur immediately following treatments. The potential for these effects would be minimized by the implementation of best management practices during the treatment process. Increases in water availability (mainly springflows and baseflows) would occur in areas conducive to groundwater recharge and discharge.



Table 4.1-1 (Continued)

SOIL RESOURCES	
Goal – Maintain or improve long-term soil quality.	
Alternative A	Current soils impacts and accelerated erosion losses primarily result from changing ecological conditions within the District. Such factors include reduction in perennial herbaceous understory and widely scattered minor surface disturbances such as those resulting from concentrations of grazing animals, off-highway vehicle use, and various other human activities. Under Alternative A, the effects of accelerated erosion on soil resources would continue their current trends.
Alternative B	Under Alternative B, the scale of vegetation treatment would increase the short-term risk for accelerated erosion in the event of extensive soil disturbance or delays in restoration success. However, the implementation of best management practices, including restoration monitoring, would minimize this impact. On a long-term basis, the erosion potential of restored areas would be diminished, soil quality would be enhanced, and activities contributing to accelerated erosion and sedimentation would be reduced over much of the District. Restoration of vegetation resilience and return to historical fire regimes would result in reduced impacts to soils when fires occur.
Alternative C	Alternative C would involve substantial increases in terms of vegetation treatment. Thus, it would involve short-term erosion risk, but long-term improvement to soil stability and quality. Short-term impacts from management of vegetation and other resources would be minimized by best management practices. Long-term reductions in accelerated erosion may be limited by the emphasis on commodity production.
Alternative D	Alternative D would involve some increases in rates of vegetation treatment, but with a limited approach and treatment scale. It also would involve limited fire suppression. Thus, Alternative D would create long-term erosion risk, limit long-term benefits to soil quality from vegetation treatments, and enhance erosion risk from major fire events. Erosion-generating human activities such as off-highway vehicle use would be substantially reduced over much of the District, but benefits from limiting these more concentrated activities would likely be offset by more widespread increases in accelerated erosion from major wildfires.
Alternative E	Over the short term, Alternative E would be expected to increase the risk of soil erosion and temporary loss of productivity on freshly treated areas. Implementation of best management practices, including restoration monitoring, would minimize these risks. Long-term reductions in erosion rates and increases in soil quality would be expected with successful widespread vegetation restoration and weed management.
VEGETATION	
Goal – Where possible, manage vegetation resources to achieve or maintain resilient ecological conditions while providing for sustainable multiple uses and options for the future across the landscape.	
Alternative A	The historic rate of treatment (largely fire rehabilitation) each year to restore desirable perennial herbaceous species and restore ecological resiliency would be increased to the extent allowed under the current fire plan. This rate, however, is not considered adequate to match the current rate of ecological deterioration, increase in woody fuel, and expansion of weedy species throughout the District, and substantial long-term effects are anticipated.
Alternative B	Treatment rates and treated areas would increase substantially beyond current levels, thereby reversing the expansion of annual invasive-dominated communities and the expansion of pinyon and juniper trees into sagebrush communities over the long term. Following restoration treatments, these areas would be more resilient to future disturbance.
Alternative C	Treatment rates and treated areas would increase substantially beyond current levels, thereby slowing and potentially reversing the expansion of annual invasive-dominated communities and the expansion of pinyon and juniper trees into sagebrush communities. Treatments would produce a narrower range of desired conditions than Alternative B, requiring more frequent future treatments. Over the long term, untreated areas would be larger than in Alternative B and would become more vulnerable to major widespread fires. Thus, the long-term impact would likely be comparable to or greater than Alternative A.
Alternative D	Passive management would result in continued proliferation of tree species into historic sagebrush-dominated sites with minimal prospects for restoration of resiliency. Increases in fuel loading in many communities plus minimal fire suppression would lead to widespread fires with the resultant burned areas being converted to the herbaceous state or an altered state dominated by annual invasive species.
Alternative E	Treatment rates and treated areas would increase substantially beyond current levels, thereby slowing and reversing the expansion of annual invasive-dominated communities and the expansion of pinyon and juniper trees into sagebrush communities. Following restoration treatments, these areas would be more resilient to future disturbance, and the presence of vegetation mosaics (as opposed to continuous expanses of sagebrush or pinyon-juniper woodland) would reduce the long-term risk of future devastating fire events.



Table 4.1-1 (Continued)

FISH AND WILDLIFE	
<b>Aquatic Habitat and Fisheries</b>	
<b>Goal – In cooperation with the Nevada Department of Wildlife, manage suitable aquatic habitats to sustain nonnative fisheries and minimize conflicts between nonnative and native fish species. (Bonneville cutthroat trout are discussed under Special Status Species.) Native nongame fisheries are discussed in the Special Status Species section.</b>	
Alternative A	Fisheries management would focus on sustaining habitats for nonnative fisheries by following Resource Advisory Council standards and guidelines. Conflicts with native species would be handled on a case-by case basis. Other programs could continue to affect habitat for nonnative fisheries as a result of sedimentation, vegetation removal, and habitat alteration due to surface disturbance. Upland areas would continue to degrade in terms of vegetation loss and erosion, which would indirectly affect riparian areas along streams and springs. Land and realty actions (e.g., rights-of-way or disposals) could involve subsequent changes in demand for either surface or groundwater resources throughout the District with resultant effects to aquatic habitat as a result of flow or water level changes.
Alternative B	Fishery management would result in maintenance and enhancement of habitat parameters involving riparian vegetation. Most of the same programs discussed in Alternative A also could affect fish habitat as a result of sedimentation, vegetation removal, or habitat alteration. Vegetation management would result in greater short-term impacts through erosion and vegetation removal as a result of increased treatment areas. On a long-term basis, these habitats would be improved along with the improvement of vegetation resilience and ecological health in the nearby riparian and upland areas. Fish habitat could be improved in Meadow Valley Wash and Clover Creek due to the ACEC designations and elimination of wild horses, respectively.
Alternative C	Management of nonnative fisheries would implement mitigation to resolve conflicts between nonnative and native fish species. Other programs would result in the same types of impacts discussed in Alternatives A and B. Increased sedimentation could affect aquatic habitat in the short term as a result of vegetation treatments and in the long term as a result of fire management. Watershed management could result in long-term improved habitat conditions in treated areas with an emphasis on recreation. Stream habitats in untreated areas would be jeopardized by increased risk of intense wildfires.
Alternative D	Habitat for nonnative fisheries would not be actively managed, which could involve the elimination of nonnative populations in some water bodies, and no new nonnative fisheries would be established. Greater impacts to nonnative fisheries habitat could occur due to uncontrolled wild horse population increases in herd management areas, increased dispersed recreation, and fire management with minimal fire suppression. Less short-term erosion would occur from vegetation treatment, but in the long term, erosion and sedimentation would be greater due to more intense fires.
Alternative E	Nonnative fisheries management would include habitat enhancement for native fish species where the two types of fisheries coexist. Vegetation treatments could result in increased short-term impacts from erosion and sedimentation immediately after treatment. These impacts would be minimized through implementation of best management practices during the treatment process. Changes in grazing management in riparian areas and restoration of vegetation resilience in nearby riparian and upland areas would improve habitat conditions over the long term.
<b>Wildlife</b>	
<b>Goal – In cooperation with Nevada Department of Wildlife, provide habitat for wildlife (i.e., forage, water, cover, and space) that is of sufficient quality and quantity to support productive and diverse wildlife populations in a manner consistent with the principles of multiple-use management; to enhance biological diversity; and to sustain the ecological, economic, and social values necessary for all species.</b>	
Alternative A	Although restoration would promote more suitable habitat conditions for wildlife species on a localized basis, long-term watershed level effects would continue to result in the conversion of vegetation cover types, increased tree density and canopy cover, decreased forest and shrub community structure, and a reduction in herbaceous cover for wildlife species. Landscape level effects would continue to result in increased habitat degradation and fragmentation, and a reduction in ecological health and vegetation resiliency.
Alternative B	On a watershed level, restoration activities would result in increased herbaceous forage, increased cover and community structure, and increased habitat quality for wildlife species. On a landscape level, restoration activities would improve wildlife habitats by reducing habitat degradation and fragmentation, promoting ecological health, and improving vegetation resiliency. Increased areas of treatment and widespread use of prescribed fires and managed natural fires would reduce the more severe impact of wildfires.
Alternative C	Implementation of this alternative would favor increased populations and expansion of high commodity wildlife species (e.g., elk). On a watershed level, wildlife conflicts would include decreased shrub cover, reduced community structure, and increased competition for habitat by sagebrush-dependent species. Landscape level effects would result in improved ecological health and vegetation resiliency despite a reduction in shrub and woodland-dominated areas. Increased potential for major widespread fires also would affect wildlife habitat over the long term.



Table 4.1-1 (Continued)

Alternative D	The passive management approach of this alternative coupled with minimal fire suppression would result in continued degradation of wildlife habitat with increased tree density and canopy cover and a reduction of native herbaceous understory species. These habitat changes would result in reductions of herbaceous forage, plant community structure and complexity, and overall habitat suitability for wildlife species. Increased potential for major widespread fires also would affect wildlife habitat over the long term.
Alternative E	On a watershed level, restoration activities would result in increased herbaceous forage, increased cover and vegetation structure, and increased habitat quality for wildlife species. On a landscape level, restoration activities would improve wildlife habitats by reducing habitat degradation and fragmentation, promoting ecological health, and improving vegetation resiliency. Increased areas of treatment and widespread use of managed natural fire and prescribed fires would reduce the more severe impact of wildfires.
<b>SPECIAL STATUS SPECIES</b>	
<b>Plant Species</b>	
<b>Goal – Manage public land to maintain, restore, improve, or enhance populations and habitats which lead to the recovery of federally-listed species and preclude the need for listings of proposed, candidate, state-protected, or sensitive species.</b>	
Alternative A	A detailed analysis of potential impacts to special status plants would be completed during watershed and habitat analyses. As part of the standard operating procedures, potential mitigation measures and monitoring would be applied on a site-specific basis. Therefore, implementation of Alternative A would result in minimal short- and long-term impacts to special status plants and enable additional management emphasis for any populations identified during the watershed analysis.
Alternative B	The initiation of a systematic survey of potential habitats for the Ute ladies'-tresses orchid, development of recovery actions and a conservation strategy for potential habitat for or possible new occurrences of Ute ladies'-tresses orchid, and development of a detailed monitoring and inventorying plan for the Sunnyside green gentian would provide additional protection and recovery prospects for these species. The establishment of 18 ACECs for the protection of other resources and the land use restrictions associated with these ACECs may offer additional protection where and if special status plants occur in these areas. Therefore, implementation of Alternative B would result in additional protection for special status plants.
Alternative C	A detailed analysis of potential impacts to special status plants would be completed during watershed and habitat analyses. As part of the standard operating procedures, potential mitigation measures and monitoring would be developed on a site-specific basis. In addition, the establishment of 20 ACECs for the protection of other resources and the land use restrictions associated with these ACECs may offer additional protection where and if habitat for special status plants occur in these areas. Therefore, implementation of the Alternative C would result in additional protection for special status plants.
Alternative D	Potential habitat for Ute ladies'-tresses orchid and Sunnyside green gentian could improve in the District with the elimination of grazing and most other physical disturbances. A detailed analysis of potential impacts to special status plants would be completed during watershed and habitat analyses. The additional protection resulting from these measures, however, would be offset by the potential damage to special status plant populations resulting from increased wildfires and uncontrolled wild horse populations under this alternative.
Alternative E	A detailed analysis of potential impacts to special status plants would be completed in conjunction with each watershed and habitat analysis. As part of the standard operating procedures, potential mitigation measures and monitoring would be developed on a site-specific basis. Eighteen new ACECs would be established for the protection of other resources. The establishment of these ACECs and the land use restrictions associated with them may offer additional protection where and if special status plants occur in these areas. Therefore, implementation of Alternative E would result in additional protection for special status plants.
<b>Aquatic Species</b>	
<b>Goal – Manage public land to maintain, restore, improve, or enhance populations and habitats which lead to the recovery of federally listed species and preclude the need for listings of proposed, candidate, state-protected, or sensitive species.</b>	
Alternative A	Management for sensitive fish and invertebrate species would focus on the maintenance, mitigation, and restoration of habitat, as identified in the management and recovery plans for the species. Habitat for Pahump poolfish in the Shoshone Ponds would be protected by fencing around the ponds. Other programs would continue to result in sedimentation and habitat alteration due to surface disturbance. Development of disposed lands could involve uses with water consumption requirements that could affect habitat through changes in flow or water level.



Table 4.1-1 (Continued)

Alternative B	Sensitive fish and invertebrate species would be managed through evaluations of their overall habitat conditions. Numerous resource uses could affect sensitive aquatic habitat as a result of sedimentation, vegetation removal, or habitat alteration. However, grazing impacts would be eliminated. Vegetation management could result in greater short-term impacts through erosion and sedimentation as a result of increased treatment areas. Management and restoration plans with two new ACECs would help restore habitat for fish species in Condor Canyon and Lower Meadow Valley Wash. On a long-term basis, the restoration of vegetation resilience in riparian areas and the surrounding uplands would improve habitat conditions for sensitive fish and invertebrate species.
Alternative C	Program-specific impacts would be similar to Alternative A. However, sediment-related impacts to Pahrump poolfish could be reduced by fence repair around Shoshone Ponds. Most other programs would result in the same types of impacts discussed for Alternatives A or B. Increased recreation activities could result in additional surface disturbance and sediment impacts on habitat for sensitive aquatic species.
Alternative D	Emphasis on passive management of sensitive aquatic species through exclusion of commodity uses on public lands could result in improved habitat conditions. Greater impacts to nonnative fisheries habitat would occur due to uncontrolled wild horse population use in herd management areas, increased dispersed recreation, and fire management with minimal fire suppression. Less erosion would occur from vegetation treatment, but far more would occur from widespread wildfires.
Alternative E	Sensitive fish and invertebrate species would be managed through evaluations of their overall habitat conditions. Numerous resource uses could affect sensitive aquatic habitat as a result of sedimentation, vegetation removal, or habitat alteration. Changes in grazing management in riparian areas could improve habitat conditions in the long-term period in the Lower Meadow Valley Wash and White River drainages. Vegetation management could result in greater short-term impacts through erosion and sedimentation as a result of increased treatment areas. Management and restoration plans with two new ACECs would help restore habitat for fish species in Condor Canyon and Lower Meadow Valley Wash. On a long-term basis, the restoration of vegetation resilience in riparian areas and the surrounding uplands would improve habitat conditions for sensitive fish and invertebrate species.
<b>Wildlife Species</b>	
<b>Goal – Manage public land to maintain, restore, improve, or enhance populations and habitats which lead to the recovery of federally listed species and preclude the need for listings of proposed, candidate, state-protected, or sensitive species.</b>	
Alternative A	Management of special status species would continue to occur predominantly at the scale of individual allotments and occasionally at a District-wide scale through management actions that address an immediate need or habitat niche for the maintenance, mitigation, and restoration of a single special status species on a case-by-case basis. Although restoration would promote more suitable habitat conditions for special status species on a localized basis, watershed level and landscape level effects would include continued habitat deterioration for many of the special status species.
Alternative B	Special status species would be specifically assessed, based on species-specific desired future conditions, and compared to overall habitat conditions and identification of causal factors for declines at the mid-scale. On a watershed level, restoration activities would result in higher quality forage, increased cover and vegetation structure, and increased security for special status species. On a landscape level, restoration activities to achieve desired range of conditions would improve special status species habitats by reducing habitat degradation and fragmentation, and promoting ecological health and resiliency.
Alternative C	Management of special status species would continue to address an immediate need or habitat niche for the maintenance, mitigation, and restoration of a single special status species on a case-by-case basis. On a watershed level, special status species conflicts would include decreased shrub cover, a reduction in vegetation community structure, and increased competition for habitat by sagebrush dependent species.
Alternative D	Management of special status species would emphasize a passive management approach through the exclusion of discretionary commodity uses of public lands. On a watershed level, natural habitat transitions would continue with increased canopy cover and possible increased regeneration of palatable species. On a landscape level, habitats would exhibit a reduction in overall habitat quality, ecological health, and resiliency as the result of major, widespread wildfires resulting in conversion to herbaceous communities. These habitat changes would result in a reduction of vegetation community structure and overall suitability of habitats for special status species.
Alternative E	Special status species would be specifically assessed, based on species-specific desired future conditions, and compared to overall habitat conditions and identification of causal factors for declines. On a watershed level, restoration activities would result in higher quality forage, increased cover and vegetation structure, and increased habitat quality for special status species. On a landscape level, restoration activities to achieve appropriate ranges of vegetation conditions would improve special status species habitats by reducing habitat degradation and fragmentation, and promoting ecological health and resiliency.



Table 4.1-1 (Continued)

WILD HORSES	
Goal – Maintain and manage healthy and genetically viable wild horses inside herd management areas within appropriate management levels to ensure a thriving natural ecological balance while preserving a multiple use relationship with other uses and resources.	
Alternative A	Alternative A would maintain several herd management areas that possess marginal or inadequate habitat to sustain wild horse populations at a level that would ensure genetic viability of the herd, thereby resulting in a high probability for continued conflicts with other resources, conflicts with private land owners, and occasional starvation and dehydration of wild horses.
Alternative B	Wild horse populations would be brought into balance with the available habitat resources needed to sustain genetically viable herds and prevent damage to the environment and surrounding resources. Vegetation treatments would, in the long term, enhance habitat conditions within the herd management areas to ensure the sustainability of healthy herds maintained at appropriate management levels.
Alternative C	Wild horse populations would be brought into balance with the available habitat resources needed to sustain genetically viable herds and prevent damage to the environment and surrounding resources. Alternative C, however, would likely have greater impacts and risks to wild horse populations than Alternative B over the long term due to increased potential for major wildfires.
Alternative D	The passive management approach in Alternative D for the existing 24 herd management areas and absence of fire management would result in rapid deterioration of ecological systems within these areas and likely starvation of many animals as populations increase beyond the support level of their habitat.
Alternative E	Wild horse populations would be brought into balance with the available habitat resources needed to sustain genetically viable herds and prevent damage to the environment and surrounding resources. Vegetation treatments would, in the long term, enhance habitat conditions within the herd management areas to ensure the sustainability of healthy herds maintained at appropriate management levels.
CULTURAL RESOURCES	
Goal – Identify, protect, and classify at-risk archaeological resources, significant historic properties, and cultural landscapes.	
Alternative A	Under Alternative A, cultural resources would continue to be managed for future resource use allocations. Indirect impacts associated with off-highway vehicle use, wild horses, livestock grazing, and recreational activities would continue to occur under existing management.
Alternative B	There would be a higher level of protection of cultural resources through use allocations, with 100 percent of the sites determined eligible to the National Register of Historic Places allocated and managed for Conservation, Scientific, and/or Public Use, and the designation of 11 new ACECs. There also would be more protection of cultural resources than Alternative A due to the decrease in lands open to off-highway vehicle use, wild horses, and livestock grazing. The level of protection from impacts associated with fire management would be greater than Alternative A, whereas the level of protection from impacts associated with recreation activities would be lower than Alternative A.
Alternative C	Cultural resource use allocations would provide greater protection of cultural resources than Alternative A; however, there would be a lower level of protection compared to Alternative B since more sites would be allocated as Discharged from Management. The decrease of lands open to off-highway vehicle use would provide more protection of cultural resources than Alternative A, but not to the extent of Alternative B. The level of protection from impacts associated with recreation and fire management would be lower than Alternatives A and B.
Alternative D	More cultural resources would be allocated and managed for Conservation Use, which would provide a higher level of protection compared to Alternatives B and C. The level of protection of cultural resources from off-highway vehicle use, recreation, and livestock grazing would be greater than Alternatives A, B, and C. Under this alternative, fire management activities would pose a higher risk to cultural resources than Alternatives A, B, and C.
Alternative E	Management of cultural resources would be the same as Alternative B. The level of protection from recreation activities would be greater than Alternatives A, B, and C, but not to the extent of Alternative D.
PALEONTOLOGICAL RESOURCES	
Goal – Identify and manage at-risk paleontological resources (scientific value), preserve and protect vertebrate fossils through best science methods, and promote public and scientific use of invertebrate and paleobotanical fossils.	
Alternative A	Paleontological resources would be managed for future use allocations. No registration system would be in place for trilobite collecting. The amount of unauthorized collecting of common invertebrate fossils (e.g., trilobites) and impacts associated with off-highway vehicle use would continue to increase as recreation and visitor use increases.
Alternative B	Paleontological resources would be provided a higher level of protection under this alternative because they would be allocated and managed for Scientific, Conservation, and/or Public Use. An increase in the number of acres withdrawn from mineral entry and a decrease in lands open to off-highway vehicle use would reduce impacts to paleontological resources. The no-fee registration system would increase the protection of known trilobite localities by tracking the amount of use and associated impacts.



Table 4.1-1 (Continued)

Alternative C	Management of paleontological resources would be the same as Alternative A, with the exception of the registration system. The fee-based registration system could reduce the number of trilobite collectors, as well as increase the protection of trilobite collecting localities and associated impacts by tracking the amount of use and associated impacts. The decrease in lands open to off-highway vehicle use would reduce impacts to paleontological resources, but not to the extent of Alternative B.
Alternative D	Management of paleontological resources would be the same as Alternative B, with the exception of trilobite collecting. Under this alternative, all trilobite collecting localities would be closed, which would provide a higher level of protection of these fossils compared to Alternatives A, B, and C. The increase in lands closed to off-highway vehicle use would reduce impacts to paleontological resources.
Alternative E	Paleontological resources would be provided a higher level of protection under this alternative because they would be allocated and managed for Scientific, Conservation, and/or Public Use. An increase in the number of acres withdrawn from mineral entry and a decrease in lands open to off-highway vehicle use would reduce impacts to paleontological resources. The no-fee registration system would increase the protection of known trilobite localities by tracking the amount of use and associated impacts.
<b>VISUAL RESOURCES</b>	
<b>Goal – Manage public land actions and activities consistent with District visual resource management class objectives.</b>	
Alternative A	Management prescriptions for Class I and II areas (approximately 1.09 million acres and 326,000 acres, respectively) would continue to preserve the scenic character of these lands. Although unclassified areas totaling approximately 3.6 million acres would be addressed on a site-specific project level, there potentially could be impacts by not having a comprehensive framework for addressing visual resources in place, in the old Egan Resource Area. Continued designation of areas open to cross-country off-highway vehicle use would result in visual impacts through surface disturbances and impacts to air quality.
Alternative B	Management prescriptions under this alternative would increase the amount of land in Visual Resource Management Class II by over 2.2 million acres. Having classifications for all lands within the District would allow for a more comprehensive framework for preserving and mitigating impacts to visual resources. Maximizing the use of prescribed fire would create short term visual impacts that would diminish in the long term after treatments are completed.
Alternative C	Management prescriptions under this alternative would increase the amount of land in Visual Resource Management Class II by approximately 2.03 million acres. Having classifications for all lands within the District would allow for a more comprehensive framework for preserving and mitigating impacts to visual resources. Utility corridor widths of three miles and the location of the Spring Valley utility corridor adjacent to Highway 893 would create greater impacts in localized areas. Suppression of wildfires would reduce impacts from fire in the short term until wildland fires became impossible to suppress, which could lead to greater long-term impacts.
Alternative D	Management prescriptions under this alternative increase the amount of land in Visual Resource Management Class II by almost 10 million acres. By identifying all areas as either Class I or II, substantial restrictions would be placed on activities that could be allowed under other resource management activities or increase the potential mitigation measures that would be required. The fact that there would be no new land use authorizations, such as rights-of-way, also would reduce impacts in the short and long term. A policy of minimal fire suppression would create short term visual impacts which would increase over the long term as catastrophic fires occur.
Alternative E	Management prescriptions under this alternative would increase the amount of land in Visual Resource Management Class II by over 2.1 million acres. Having classifications for all lands within the District would allow for a more comprehensive framework for preserving and mitigating impacts to visual resources. Maximizing the use of prescribed fire and managed natural fire would create short term visual impacts that would diminish in the long term after treatments are completed.
<b>LANDS AND REALTY</b>	
<b>Goal 1 – Manage public lands in a manner that allows the retention of public land with high resource values and consolidates public land patterns to ensure effective administration and improve resource management. Make available for disposal public lands that promote community development. Utilize withdrawal actions with the least restrictive measures and minimum size necessary to accomplish the desired purpose.</b>	
Alternative A	Approximately 28,531 acres are identified for possible disposal and 14,770 acres are identified for withdrawal. This management direction does not identify additional lands for possible disposal that would meet the objectives of BLM, benefiting communities, or the Lincoln County Conservation, Recreation, and Development Act of 2004. There would not be a proactive effort toward identifying areas of sensitive or high resource values for withdrawal from entry.



Table 4.1-1 (Continued)

Alternative B	Approximately 87,834 acres would be available for possible disposal and approximately 64,156 acres would be withdrawn. Watershed analyses and subsequent restoration plans would identify lands to be retained as critical habitat for threatened or endangered species or habitat for other special status species. Withdrawing these sensitive and high resource value areas from surface and mineral entry would reduce land available for disposal as compared to Alternative A, but the removal of requirements pertaining to the retention of big game habitat, upland game habitat, and wild horse herd management areas would allow more flexibility in conducting lands and realty actions.
Alternative C	Approximately 288,744 acres would be available for possible disposal and approximately 200,243 acres would be withdrawn. The amount of land identified for potential disposal in Lincoln County exceeds the amount stipulated in the Lincoln County Conservation, Recreation, and Development Act of 2004. Watershed analyses and subsequent restoration plans would identify lands to be retained as critical habitat for threatened or endangered species. Withdrawing these sensitive and high resource value areas from surface and mineral entry would reduce land available for disposal as compared to Alternative A, but the removal of requirements pertaining to the retention of big game habitat, upland game habitat, wild horse herd management areas, special status species habitats, wetlands and riparian areas would allow more flexibility in conducting lands and realty actions.
Alternative D	Approximately 12,790 acres would be available for possible disposal and withdrawal. Because there would be no net loss of acreage managed by the BLM, no disposals would be available to occur to promote community development, unless they were offset by acquisitions. This would limit the ability of BLM to dispose of land for community and economic development, or for other purposes. Because requests for new withdrawals, withdrawal relinquishments, or modifications would be processed on a case-by-case basis, there would not be a proactive effort toward identifying areas of sensitive or high resource values for withdrawal from entry.
Alternative E	Approximately 95,677 acres would be identified as available for possible disposal and approximately 71,999 acres would be withdrawn. Watershed analyses and subsequent restoration plans would identify lands to be retained as critical habitat for threatened or endangered species. Withdrawing these sensitive and high resource value areas from surface and mineral entry would serve to reduce the amount of land available for possible disposal as compared to Alternative A, but the removal of requirements pertaining to the retention of big game habitat, upland game habitat and wild horse herd management areas would allow more flexibility in conducting lands and realty actions.
<b>Goal 2 – Meet public needs for use authorizations such as rights-of-way, permits, leases, and easements while avoiding or minimizing adverse impacts to other resource values.</b>	
Alternative A	Alternative A allows flexibility in land use authorizations while encouraging co-location of facilities. By not identifying new communication sites or 0.5-mile wide corridors, the location of future rights-of-way and communication sites would not be addressed proactively and could take longer to occur by being addressed on a case-by-case basis under site-specific NEPA analyses.
Alternative B	Alternative B would allow a degree of flexibility in land use authorizations while requiring co-location of facilities to a greater extent. The proactive identification of new 0.5-mile wide corridors and communication sites would allow more flexibility and timeliness in addressing future land use authorization needs.
Alternative C	Alternative C would allow a degree of flexibility in land use authorizations while encouraging co-location of facilities. The proactive identification of new corridors and communication sites would allow more flexibility and timeliness in addressing future land use authorization needs. Presumably, the 3-mile width of designated utility corridors would allow for co-location of more rights-of-way within utility corridors.
Alternative D	Limitations on new land use authorizations, and the closure of sites within migratory bird corridors and visually sensitive sites would greatly restrict lands and realty actions in Alternative D. The possible elimination of existing communication sites would further reduce the ability of the lands and realty program to address future needs.
Alternative E	Alternative E would allow a degree of flexibility in land use authorizations while encouraging co-location of facilities. The proactive identification of new 0.5-mile-wide corridors and communication sites would allow more flexibility and timeliness in address future land use authorization needs.
<b>RENEWABLE ENERGY</b>	
<b>Goal – Provide opportunities for development of renewable energy sources such as wind, solar, biomass, and other alternative energy sources while minimizing adverse impacts to other resources such as wildlife and visual resources.</b>	
Alternative A	The current management policy of evaluating and authorizing renewable energy projects on a case-by-case basis does not provide the opportunity to develop management strategies for anticipated future conditions nor a consistent approach to issuing land use authorizations. It also would not prevent the preemptive use of water resources that could be used for renewable energy, thereby potentially reducing renewable energy development.



Table 4.1-1 (Continued)

Alternative B	Identification of areas of high potential for renewable energy development may help to facilitate wind and solar energy development. Approximately 201,000 acres of potential wind development areas and approximately 6.77 million acres of potential solar development areas are identified. The management direction would address issues as they arise, but would not provide the opportunity to develop management strategies for anticipated future conditions. It also would not prevent the preemptive use of water resources that could be used for renewable energy, thereby potentially reducing renewable energy development.
Alternative C	Identification of areas of high potential for renewable energy development may help to facilitate wind and solar energy development. Approximately 203,000 acres of potential wind development areas and approximately 6.77 million acres of potential solar development areas are identified. The management direction would address issues as they arise, but would not provide the opportunity to develop management strategies for anticipated future conditions. It also would not prevent the preemptive use of water resources that could be used for renewable energy, thereby potentially reducing renewable energy development.
Alternative D	Under Alternative D, renewable energy development would be severely restricted through the prohibition on new land use authorizations.
Alternative E	Identification of areas of high potential for renewable energy development may help to facilitate wind and solar energy development. Approximately 205,000 acres of potential wind development areas and approximately 6.77 million acres of potential solar development areas are identified. The management direction would address issues as they arise, but would not provide the opportunity to develop management strategies for anticipated future conditions. It also would not prevent the preemptive use of water resources that could be used for renewable energy, thereby potentially reducing renewable energy development.
<b>TRAVEL MANAGEMENT AND OFF-HIGHWAY VEHICLE USE</b>	
<b>Goal – Provide and maintain suitable access to public lands. Manage off-highway vehicle use to protect resource values, promote public safety, provide off-highway vehicle opportunities where appropriate, and minimize conflict.</b>	
Alternative A	The current management program addresses issues as they arise and on a case-by-case basis. Continuation of an open designation for the majority of the District provides for the greatest accessibility but would result in increased conflict between other resource users and off-highway vehicle users over time.
Alternative B	Alternative B would have proactive management and maintenance of the roads and trails in the District. As the existing road system is evaluated on a watershed basis, roads potentially would be closed or limited. Overall, this management could decrease access by motorized vehicles in the short term and possibly in the long term depending on whether or not roads were permanently closed. Off-highway vehicle use opportunities would be impacted through the elimination of areas open to cross-country off-highway vehicle use.
Alternative C	Alternative C would have proactive management and maintenance of the roads and trails in the District. As the existing road system is evaluated on a watershed basis, roads potentially would be closed or limited. Overall, this management could decrease access by motorized vehicles in the short term and possibly in the long term depending on whether or not roads were permanently closed. Off-highway vehicle use opportunities would be impacted through the reduction of areas open to cross-country off-highway vehicle use to approximately 32,000 acres.
Alternative D	Alternative D would substantially restrict motorized travel in the District in the short and long term. The lack of new land authorizations would reduce accessibility in the long term.
Alternative E	The elimination of cross-country off-highway vehicle use and the prioritization of road and trail designations through an updated transportation plan would have short- and long-term impacts to travel management, but would reduce off-highway vehicle use opportunities. The designation of 734,000 acres emphasizing motorized recreation on designated roads and trails within special recreation management areas would help to offset the elimination of areas open to cross-country off-highway vehicle use.
<b>RECREATION</b>	
<b>Goal – Provide quality settings for developed and undeveloped recreation experiences and opportunities while protecting resources.</b>	
Alternative A	As recreation use continues to increase over time, the limited number of recreation sites eventually would lead to increased competition for recreation opportunities. With only one special recreation management area on the District and no further creation of developed recreation sites, the ability to manage recreation as a primary objective in areas with high recreation potential would be constrained.
Alternative B	Alternative B would constitute a comprehensive program that addresses the trend of increasing recreational use as well as providing the opportunity to develop management strategies for anticipated future conditions. Nine special recreation management areas totaling approximately 2.68 million acres would be designated. Elimination of areas designated as open to cross-country off-highway vehicle use could reduce motorized recreational opportunities.



Table 4.1-1 (Continued)

Alternative C	Alternative C would constitute a comprehensive program that would address the trend of increasing recreational use as well as providing the opportunity to develop management strategies for anticipated future conditions. Ten special recreation management areas totaling approximately 3.31 million acres would be designated. Reduction of areas designated as open to cross-country off-highway vehicle use could reduce motorized recreational opportunities.
Alternative D	The spectrum of recreation opportunities would be greatly reduced under this alternative as there would be no special recreation management areas and all existing developed recreation sites would be eliminated.
Alternative E	Alternative E would constitute a comprehensive program that addresses the trend of increasing recreational use as well as providing the opportunity to develop management strategies for anticipated future conditions. Nine special recreation management areas totaling approximately 2.68 million acres would be designated. Elimination of areas designated as open to cross-country off-highway vehicle use could reduce motorized recreational opportunities, while designating motorized trails could enhance recreation opportunities.
<b>LIVESTOCK GRAZING</b>	
<b>Goal – Manage the public lands to provide for a level of livestock grazing consistent with multiple use, sustained yield, and watershed function and health.</b>	
Alternative A	Approximately 11.2 million acres would remain open to grazing under existing management on 235 allotments, subject to potential land sales currently authorized for possible disposal.
Alternative B	Approximately 3.6 million acres of additional grazing area affecting 189 total allotments would be closed to grazing for desert tortoise habitat, bighorn sheep habitat, and new ACECs (beyond the 212,500 acres already closed in the existing desert tortoise ACECs) resulting in long-term impacts to livestock grazing. Vegetation treatments and protection of freshly seeded areas also could temporarily affect grazing on substantial areas during the treatment process causing short-term impacts. It is expected, however, that increased forage production on previously treated areas would offset temporary reductions in these allotments.
Alternative C	Approximately 11.2 million acres would remain available for grazing in 235 existing allotments, subject to potential land sales of up to 288,744 acres. These areas would be closed to grazing when they are sold. Long-term fire impacts to grazing would be substantial. Vegetation treatments and protection of freshly seeded areas also could temporarily affect grazing on substantial areas during the treatment process, but it is expected that increased forage production on previously treated areas would offset temporary reductions in these allotments.
Alternative D	Elimination of the livestock grazing program within the District would constitute a major change in policy with attendant impacts to livestock grazing, other resource uses, and users.
Alternative E	Approximately 11.2 million acres would remain available for grazing in 235 existing allotments, subject to potential land sales of up to 114,200 acres. These areas would be closed to grazing when they are sold. Sheep and goat grazing would be affected on approximately 2.96 million acres in 49 existing allotments. Vegetation treatments and protection of freshly seeded areas also could temporarily affect grazing on substantial areas during the treatment process, but it is expected that increased forage production on previously treated areas would offset temporary reductions in those allotments.
<b>WOODLAND AND NATIVE PLANT PRODUCTS</b>	
<b>Goal – Provide opportunities for traditional and non-traditional uses of vegetation products on a sustainable, multiple-use basis.</b>	
Alternative A	Current supplies of woodland and native plant products including fuelwood, posts and poles, Christmas trees, pinyon pine nuts, various native seeds, and live plants of selected species for transplantation are adequate to meet existing demands. It is expected that availability of these woodland products would continue to exceed the expected demand.
Alternative B	Alternative B would expand the number of species permitted for use as fuelwood, posts and poles, and Christmas trees, providing a wider opportunity for personal and commercial use. The increased availability is not likely to affect the overall resource supply for any of the species involved. Availability of woodland products would exceed the expected demand. On a long-term basis, the production of woodland products from restored and resilient communities is expected to exceed current levels.
Alternative C	Alternative C would expand the number of species permitted for use as fuelwood, posts and poles, and Christmas trees and areas in which these products could be collected, thus, providing a greater opportunity for personal and commercial use. The increased availability is not likely to affect the overall resource supply for any of the species involved. Availability of woodland products would exceed the expected demand until major fires eliminated large blocks of pinyon-juniper woodlands.
Alternative D	It is highly probable that major fires at an early date under this alternative would substantially reduce the long-term supply of woodland products. However, the harvest constraints under Alternative D also would drastically reduce the demand.



Table 4.1-1 (Continued)

Alternative E	Alternative E would expand the number of species permitted for use as fuelwood, posts and poles, and Christmas trees, providing a greater opportunity for personal and commercial use. The increased availability is not likely to affect the overall resource supply for any of the species involved. Availability of woodland products would continue to exceed the expected demand on a long-term basis, the production of woodland products from restored and resilient communities is expected to exceed current levels.
<b>GEOLOGY AND MINERAL EXTRACTION</b>	
<b>Leasable Minerals</b>	
<b>Goal 1 – Allow for meeting the Nation's energy needs while providing environmentally responsible production of fluid leasable minerals, and geophysical exploration for energy resources on Public Lands.</b>	
Alternative A	The total acreage open to fluid mineral leasing would be about 90 percent of the District. Most of the closed areas are non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be less than 0.5 percent of the District.
Alternative B	The total acreage open to fluid mineral leasing would be about 89 percent of the District. Most of the closed areas are non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be less than 2 percent of the District.
Alternative C	The total acreage open to fluid mineral leasing would be about 87 percent of the District. Most of the closed areas are non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be about 3 percent of the District and are due to additional acreage closed for community land withdrawals.
Alternative D	The entire District would be closed to new leasing, but existing leases would be honored. The effects would be to preclude exploration and development (except on existing leases) and result in the loss of the resource available to the country, loss of potential lease bonus and rental revenue, loss of potential production royalties and property taxes, and other losses to related economic activity in the District. If no discoveries are made on existing leases, the leases would expire over time resulting in a total cessation of fluid mineral activities.
Alternative E	The total acreage open to fluid mineral leasing would be about 89 percent of the District. Most of the closed areas are non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed closures would be about 1 percent of the District.
<b>Goal 2 – The development of solid leasable minerals would occur in a manner to prevent undue and unnecessary degradation.</b>	
Alternative A	The total acreage open to solid mineral leasing would be about 90 percent of the District. Most of the closed areas are non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be about 0.5 percent of the District.
Alternative B	The total acreage open to solid mineral leasing would be about 89 percent of the District. Most of the closed areas would be non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be slightly less than 2 percent of the District.
Alternative C	The total acreage open to solid mineral leasing is about 87 percent of the District. Most of the closed areas are non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be slightly less than 4 percent of the District and is due to additional acreage closed for community land withdrawals.
Alternative D	The entire District would be closed to leasing of solid minerals and discretionary closures would comprise almost 91 percent of the District. The closures would preclude development of solid mineral resources.
Alternative E	The total acreage open to solid mineral leasing would be about 89 percent of the District. Most of the closed areas would be non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be about 1 percent of the District.
<b>Locatable Minerals</b>	
<b>Goal – Allow development of locatable minerals in a manner to prevent undue and unnecessary degradation.</b>	
Alternative A	The total acreage open to locatable minerals would be about 90 percent of the District. Most of the withdrawn areas would be non-discretionary withdrawals for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary withdrawals would be about 0.5 percent of the District.



Table 4.1-1 (Continued)

Alternative B	The total acreage open to locatable minerals would be about 89 percent of the District. Most of the withdrawn areas would be non-discretionary withdrawals for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary withdrawals would be slightly less than 2 percent of the District.
Alternative C	The total acreage open to locatable minerals would be about 87 percent of the District. Most of the withdrawal areas would be non-discretionary withdrawals for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary withdrawals would be slightly less than 4 percent of the District and are due to additional acreage closed for community land withdrawals.
Alternative D	The acreage open to locatable minerals would be about 37 percent of the District. Discretionary withdrawals would be about 63 percent of the district. The withdrawal of almost two-thirds (including non-discretionary withdrawals) of the District would cause severe limitations on access to potential developable locatable mineral deposits. Inability to explore and develop locatable minerals would result in loss of the resource to the country, loss of tax revenue, and other losses to related economic activity in the District.
Alternative E	The total acreage open to locatable minerals would be about 89 percent of the District. Most of the proposed withdrawal areas would be non-discretionary withdrawals for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary withdrawals would be about 1 percent of the District.
Saleable Minerals	
Goal – Allow development of saleable minerals in a manner that would prevent undue and unnecessary degradation, meet public demand, and minimize adverse impacts to other resource values.	
Alternative A	The total acreage open to saleable mineral disposal would be about 88 percent of the District. Most of the closed areas are non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be about 2.5 percent of the District.
Alternative B	The total acreage open to saleable mineral disposal would be about 84 percent of the District. Most of the closed areas would be non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be less than 7 percent of the District.
Alternative C	The total acreage open to saleable mineral disposal would be about 82 percent of the District. Most of the closed areas would be non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be about 8 percent of the District and is due to additional acreage closed for community land withdrawals.
Alternative D	The entire District would be closed to disposal of saleable minerals and discretionary closures would comprise about 91 percent of the District. The closure would preclude development of saleable mineral resources and result in the loss of the resource to the public and the loss of related economic activity.
Alternative E	The total acreage open to saleable mineral disposal would be about 84 percent of the District. Most of the closed areas would be non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be slightly more than 6 percent of the District.
WATERSHED MANAGEMENT	
Goal – Manage watersheds to restore and maintain resistance and resiliency to disturbances.	
Alternative A	Treatments would not occur at a scale and rate adequate to address the magnitude and extent of ecological problems on the District. Thus, the rate of treatment under this alternative, when combined with actions proposed for vegetation, fish and wildlife, special status species, wild horses, livestock grazing, and fire management, has a low probability of achieving noticeable gains in District-wide resiliency.
Alternative B	The restoration approach of Alternative B, when combined with the actions proposed for vegetation, fish and wildlife, special status species, wild horses, livestock grazing, and fire management, addresses all of the watershed health management issues on the District with the scale of treatments needed to reverse the historic deterioration in rangeland health and restore vegetation resiliency.
Alternative C	When combined with the actions proposed for vegetation, fish and wildlife, special status species, wild horses, livestock grazing, and fire management, treatments would occur at a scale and rate that would reverse the historic deterioration in rangeland health and restore resiliency of vegetation communities. However, the narrower range of desired conditions (with greater emphasis on the herbaceous state) in this alternative as compared to Alternative B would require more effort and more frequent treatments to achieve and maintain. The higher probability for widespread fire over the long term also would necessitate greater efforts for fire suppression and rehabilitation as opposed to planned treatments.



Table 4.1-1 (Continued)

Alternative D	Treatments would not occur at a scale and rate, when combined with the actions proposed for vegetation, fish and wildlife, special status species, wild horses, livestock grazing, and fire management, that would reverse the historic deterioration in rangeland health and restore resiliency of vegetation communities. The long-term consequences would be more dramatic and severe than in other alternatives due to the differences in fire management and other programs.
Alternative E	The restoration approach of Alternative E, when combined with the actions proposed for vegetation, fish and wildlife, special status species, wild horse, livestock grazing, and fire management, addresses all of the watershed health management issues on the District with the scale of treatments needed to reverse the historic deterioration in rangeland health and restore vegetation resiliency.
<b>FIRE MANAGEMENT</b>	
<b>Goal – Provide an appropriate management response to all wildland fires, with emphasis on firefighter and public safety, consistent with overall management objectives.</b>	
Alternative A	Continued implementation of the existing Ely Managed Natural and Prescribed Fire Plan would allow case-by-case decisions based in part on where the fire occurs in relation to where in the District such fire would be considered beneficial or detrimental. This approach allows widespread use of managed beneficial wildfires (fire use) across the entire District, but limits the application of prescribed burning.
Alternative B	Implementation of this alternative would result in a major increase in the use of fire after watershed resilience is improved throughout the watersheds in the District. Fire use and prescribed fire would be implemented year-round to meet resource objectives in accordance with the revised Ely Fire Management Plan (BLM 2004a). An increase in mechanical, biological, and herbicide use may be necessary to meet management goals prior to expanding the use of fire.
Alternative C	Full suppression of fires within the District would be practical only on a short-term basis. Over the long term, the attempts at full suppression would probably lead to catastrophic widespread fires resulting in long-term ecological damage and increased risk to human safety and property.
Alternative D	Buildup of fuels would occur throughout the District and eventually lead to catastrophic fires, resulting in long-term ecological damage and increased risk to human safety and property. It is expected that such fires would occur earlier in time with this alternative than with Alternative C.
Alternative E	Implementation of this alternative would result in a major increase in the use of fire after watershed resilience is improved throughout the watersheds in the District. Fire use and prescribed fire would be implemented year-round to meet resource objectives in accordance with the revised Ely Fire Management Plan (BLM 2004a). An increase in herbicide use also may be necessary to meet management goals prior to expanding the use of fire.
<b>NOXIOUS AND INVASIVE WEED MANAGEMENT</b>	
<b>Goal – Prevent the introduction and spread of noxious and invasive weeds. Control or eradicate existing populations.</b>	
Alternative A	Weed control efforts historically have focused primarily on toxic and noxious weed species with less attention devoted toward the spread of annual invasive species such as cheatgrass, which provide usable forage during a short grazing season each spring. Current management includes emphasis on slowing and reversing the spread of these invasive species through application of integrated pest management methods. Under this alternative, the rate of spread of noxious and invasive weeds would increase in both the short and long term.
Alternative B	Alternative B would be similar to Alternative A in terms of weed management, but the substantial increase in vegetation treatments under this alternative would temporarily increase the risk of weed invasion and expansion in areas disturbed by treatment but reduce the vulnerability of these same areas on a long-term basis. Therefore, this alternative would reduce the rate of spread of noxious and invasive weeds on a long-term basis.
Alternative C	The level of vegetation treatments involved in Alternative C would be approximately the same as Alternative B. This alternative, like Alternative B, would reduce the long-term impacts of noxious and invasive weeds through vegetation treatments, but this would likely be offset by the increased probability of weed establishment and spread following major wildfire events.
Alternative D	Weed management would involve exclusion of some groups of herbicides. This would effectively reduce the capability to control several weed species and increase impacts associated with noxious and invasive weeds. The combination of weed management actions with other program actions under this alternative would not reduce the rate of spread of noxious and invasive weeds in the long term.
Alternative E	Alternative E involves a combination of weed management similar to Alternative A plus vegetation treatments at a substantially greater scale than Alternative A to restore vegetation resilience. On a long-term basis, this is expected to result in a substantial reduction in the risk of establishment and spread of noxious and invasive species.
<b>SPECIAL DESIGNATIONS</b>	
<b>Goal – Evaluate areas of interest for special designation and appropriately manage those areas that meet necessary requirements.</b>	
Alternative A	Approximately 212,500 acres would retain their designation as three ACECs.
Alternative B	Approximately 353,900 acres would be designated as three existing and 18 new ACECs.
Alternative C	Approximately 348,400 acres would be designated as three existing and 20 new ACECs.



Table 4.1-1 (Continued)

Alternative D	All special designations would be eliminated, but with minimal activity in other management programs, no impacts to the sensitive resources are anticipated from other uses.
Alternative E	Approximately 347,900 acres would be designated as three existing and 18 new ACECs.
<b>ECONOMIC AND SOCIAL CONDITIONS</b>	
<b>Goal – No program-specific goals have been identified for economic and social conditions or health and safety.</b>	
<b>Economic Conditions</b>	
Alternative A	Alternative A would result in minor, long-term economic impacts (jobs, income, locally derived taxes, etc.) across the Ely District. Such impacts would intensify over time, accruing across the entire District, though not necessarily uniformly. The adverse economic impacts in Lincoln County would be masked by major, long-term economic growth associated with the Lincoln County Land Act. The Lincoln County Land Act impacts are unrelated to the RMP and would be undifferentiated across alternatives. Federal payments in lieu of taxes and grazing fees received by White Pine County would decline by as much as \$86,000 annually, but increase in Lincoln County. Changes in payments in lieu of taxes and grazing fees would be minor relative to the total budgets of the affected local governments.
Alternative B	Alternative B would result in minor, long-term enhancements of the local economy, e.g., 255 to 260 jobs, across the Ely District due to the added restoration funding, enhanced woodland commodity availability, and increases in big-game hunting. Gains would be tempered by long-term decreases in farm/ranch income from allotment closures in the Mojave Desert and bighorn sheep habitat. Lincoln County would see major, long-term economic growth triggered by the Lincoln County Land Act. Annual payments in lieu of taxes to White Pine County would be lower than at the present, but higher than under Alternative A. Payments in lieu of taxes would increase in Lincoln County. RMP-related impacts on local fiscal conditions would be minor and long-term relative to local budgets.
Alternative C	Alternative C would promote increased organized and developed recreation activity in the District, compared to Alternative A, and the development of tourism and recreation-oriented facilities by both the public and private sectors. Higher levels of organized use, in the form of truck and motorcycle events, would augment continued OHV use accommodated by a management emphasis to designate roads and trails for such use. The combined organized and dispersed recreation use would stimulate recreation spending in the region, providing added stimulus to local retail, eating and drinking, lodging and other such establishments, which would increase the number of local jobs in the affected industries.
Alternative D	Alternative D would result in major, long-term economic impacts, due to substantial reductions in ranch income, wildland fire suppression, and withdrawals of lands open for mineral and energy-related development. The latter could result in foregone short-term economic benefits associated with utility construction projects precluded by the lack of utility corridors. The Lincoln County economy would experience major, long-term economic growth associated with development of lands sold under the Lincoln County Land Act. Annual payments in lieu of taxes to White Pine County would be lower than at the present, but comparable to those under Alternative A. The provision for no net loss of public lands may delay or limit land disposal actions that would otherwise foster community and economic development, thereby impacting local fiscal budgets.
Alternative E	Alternative E would result in minor, long-term enhancements of the local economy, e.g., 255 to 260 jobs, across the Ely District due to the added restoration funding, stewardship contracting, increased woodland commodity production, and developed and organized recreation. Ranch income would be adversely impacted over the short term, but would increase over the long term. Annual payments in lieu of taxes to White Pine County would be lower than at the present, but would increase in Lincoln County. RMP-related impacts on local fiscal conditions would be minor and long term relative to local budgets.
<b>Social Conditions</b>	
Alternative A	Long-term moderate to major population declines in White Pine County and moderate to major population increases in Lincoln County are projected under Alternative A. Subsequently, housing demand and prices would fall in White Pine County, while increasing in Lincoln County. Residential development in Lincoln County would increase concerns about wildland fire risks. Continuation of current management practices would be widely perceived as unresponsive to public concerns regarding declining ecological health in the Great Basin and the implications for public land use.
Alternative B	Alternative B would increase regional population by 510 to 560 residents during restoration. Generally perceived as beneficial, the gains would be relatively more concentrated around Ely. By accelerating the pace of restoration and improved ecological health, Alternative B would contribute to potential long-term population growth over and above that under Alternative A. Higher population would bolster housing markets in White Pine County. Many would view the increased restoration funding levels favorably, but would be concerned about short-term impacts on lifestyles and personal use, and future management decisions as rangeland health standards are achieved. Alternative B may hold relatively stronger appeal to those favoring resource protection and restoration.



Table 4.1-1 (Continued)

Alternative C	Alternative C would increase regional population by 190 to 210 residents during restoration. The gains and corresponding benefits on local housing markets would be concentrated around Ely. Indirect benefits from long-term commodity use, stewardship contracting, and expanded options for possible land disposal would provide minor, long-term social benefits. The management emphasis for Alternative C may hold less appeal to stakeholders desiring stronger resource protection, sportsmen, and those favoring commercial uses of woodland and native plant products than to interests promoting motorized recreation.
Alternative D	Alternative D would have little impact on regional population or housing markets, as compared to Alternative A. Alternative D carries forward several elements of Alternative A, but eliminates livestock grazing and places additional constraints on possible land disposal, mineral entry, and energy development that are viewed by residents as imperative to community and economic viability. Consequently, this alternative would hold relatively less appeal for area residents and local government officials than for those stakeholders whose specific areas of concern serve as the foundation for this alternative.
Alternative E	Alternative E would result in minor regional population increases of 510 to 560 residents during restoration, with corresponding long-term impacts on local housing markets. The gains would be relatively more concentrated around Ely. Additional social benefits may be realized from stewardship contracting, the fuels management/wildland fire risk reduction, and potential for developed recreation associated with possible land disposal. This alternative may hold relatively less appeal for those desiring maximum emphasis on resource protection and rangeland health restoration.
<b>AMERICAN INDIAN ISSUES</b>	
<b>No specific impacts are compared. See Section 4.25 to identify specific issues and the sections in which they are addressed.</b>	
<b>ENVIRONMENTAL JUSTICE</b>	
<b>Goal – No program specific goals have been identified for environmental justice.</b>	
Alternative A	No disproportionate adverse impacts to low-income populations were identified in conjunction with the resource programs, objectives, or management direction associated with Alternative A.
Alternative B	No disproportionate adverse impacts to low-income populations were identified in conjunction with the resource programs, objectives, or management direction associated with Alternative B.
Alternative C	No disproportionate adverse impacts to low-income populations were identified in conjunction with the resource programs, objectives, or management direction associated with Alternative C.
Alternative D	No disproportionate adverse impacts to low-income populations were identified in conjunction with the resource programs, objectives, or management direction associated with Alternative D.
Alternative E	No disproportionate adverse impacts to low-income populations were identified in conjunction with the resource programs, objectives, or management direction associated with Alternative E.
<b>HEALTH AND SAFETY</b>	
<b>Goal – The goal of the Health and Safety program is to ensure that management decisions are protective of life and property.</b>	
Alternative A	There would be a slight increase of risk to public health and safety because of an increased wildfire risk.
Alternative B	There would be a decrease of risk to public health and safety because of decreased wildfire risk.
Alternative C	There would be an increase of risk to public health and safety because of increased wildfire risk.
Alternative D	There would be a great increase of risk to public safety because of the increased wildfire risk and the potential for large destructive fires.
Alternative E	There would be a decrease of risk to public health and safety because of the decreased wildfire risk.







## 4.2 Air Quality and Climate

### Impact Issues

Management of certain resources and uses (e.g., renewable energy, travel management and off-highway vehicle use, mineral management, and fire management) can result in increased particulate emissions, thereby affecting air quality in the Ely District. Activities such as competitive off-highway vehicle events can produce increased levels of dust in localized areas, impair visibility, and affect other land uses (e.g., recreation). Prescribed fires and wildfires in particular may have a substantial effect on air quality in the District. Use of herbicides or other pesticides with long-term soil residual properties also may periodically affect air quality on a localized basis due to re-release of these compounds in fugitive dust.

Various members of the public have expressed concern that radioactive fallout from historic atmospheric nuclear tests at the Nevada Test Site may now be present in existing vegetation. When vegetation burns, any radioactive material present could be released, thereby posing a radiation exposure risk to BLM firefighters and others exposed to the smoke from the fires. In 1991, the National Nuclear Security Administration Nevada Operations and the State of Nevada Radiological Health Section collected soil and vegetation samples in nuclear fallout and non-fallout areas.

The results of this study concluded that there is no significant difference between samples taken in fallout and non-fallout areas. All results indicate radioactive materials, natural and man-made, are at minimum detectable amounts and within allowable averages for human health and safety for this geographic region and other areas of the U.S. The report concluded "Consequently, an individual exposed to smoke from burning vegetation in the Caliente, Ely, and Elko area, would be at no increased radiological risk than from smoke in southern Nevada or other areas of the U.S." (Nevada State Health Department 2001).

The National Nuclear Security Administration Nevada Operations also reported that previous studies published in 1981 demonstrated that fallout is not concentrated into forage over time and is presently at concentrations far below soil concentrations. They concluded that "... the concentration of radioactivity in plant life is sufficiently low as not to be of concern during a fire" (Izell 2001).

### Assumptions for Analysis

- For modeling purposes, representative weather conditions were selected for prescribed burns.
- For modeling purposes, representative weather conditions in summer when an active wildfire would occur were selected.

### Interactions with Other Programs

The air quality management program within the Ely District potentially would be affected by actions within the resource management programs for renewable energy, travel management and off-highway vehicle use, recreation, geology and mineral extraction, and fire management.



## 4.0 ENVIRONMENTAL CONSEQUENCES

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**Goal –** Meet all applicable local, state, Tribal, and National Ambient Air Quality Standards under the Clean Air Act (as amended), and prevent significant deterioration of air quality within the Ely District from all direct and authorized actions.

### **Management Common to All Alternatives:**

1. Management under all alternatives would seek to minimize, or prevent significant air quality degradation throughout the planning area by applying mitigation measures on a case-by-case basis.
2. Burn plans that include incident and cumulative air quality considerations would be developed prior to implementing all prescribed burn treatments.
3. BLM would coordinate with the Nevada Division of Environmental Protection relative to the planning of prescribed fires and other air quality related actions.
4. Activities that would be likely to significantly and adversely affect the Class II classification of public lands within the planning area, or the designation of the nearest Class I areas, such as Jarbidge Wilderness, would not be authorized.

### **Alternative A**

**Impacts from Air Quality and Climate Management Direction.** No additional BLM-specific management prescriptions have been identified in Alternative A for the air quality resource. No program-specific impacts for air quality have been identified under this alternative.

### **Impacts from Other Programs.**

*Lands and Realty.* Development of fossil fuel-fired power plants in the vicinity of the Ely RMP/EIS area may result in additional new sources of criteria and hazardous air pollutants with associated impacts to air quality in the region. Such development may require additional transmission lines through existing corridors or new transmission line corridors. Construction, maintenance, and operations would potentially degrade regional air quality.

*Renewable Energy.* Renewable energy development, construction, and operations may increase the use of heavy and light vehicles on paved and unpaved roads within the District. Dust would be controlled during construction, operations, and maintenance activities by watering or using chemical dust suppressants and posting vehicle speed limits in accordance with applicable Nevada regulations. Water sprays or chemicals would reduce emissions on roads by as much as 90 percent. Gravel on high use roads would reduce fugitive dust emissions by reducing the silt content of the surface material.

*Travel Management and Off-highway Vehicle Use.* Road construction, maintenance, and use can adversely affect air quality in the District due to fugitive dust emitted from paved and unpaved roads by



trucks, graders, pickups, and personal vehicles. Dust released from unpaved roads would be controlled during construction and maintenance activities by watering or using chemical dust suppressants and posting vehicle speed limits in accordance with applicable Nevada regulations. Water sprays or chemicals would reduce emissions on roads by as much as 90 percent. Gravel on high use roads would reduce fugitive dust emissions by reducing the silt content of the surface material.

*Recreation.* Recreational events such as off-highway vehicle races and rallies have the potential to greatly increase fugitive dust emissions from traffic on unpaved roads. Fugitive dust emissions are a function of vehicle weight and speed; and emissions increase dramatically with higher speeds even from smaller, lighter vehicles. Impacts from recreational events are controlled by limiting the number of events and the routes allowed.

*Mineral Extraction.* It is estimated that about 15,600 acres of the Ely District within the reasonably foreseeable development scenario based on the best available information. Minerals exploration, development, construction, and operations may increase heavy and light vehicle use on paved and unpaved roads within the District. Dust would be controlled during construction, operations, and maintenance activities by watering or using chemical dust suppressants and posting vehicle speed limits in accordance with applicable Nevada regulations. Water sprays or chemicals would reduce emissions on roads by as much as 90 percent. Gravel on high use roads would reduce fugitive dust emissions by reducing the silt content of the surface material.

*Fire Management.* Of the interrelated programs, fire management activities have the highest potential to adversely affect the air quality resource.

The Simple Approach Smoke Estimation Model was used to assess the impacts of wildfire and management-ignited prescribed fire smoke on air quality within the Ely District. Estimates were made of the effects of particulate matter emitted from wildfires on health standards and visibility, and from management-ignited prescribed fire that could result from the land management alternatives under consideration for the RMP/EIS. Wildfires and prescribed fires are compared because of the belief that aggressive fuel treatment can substantially reduce the likelihood of large damaging wildfires, and because prescribed fire is proposed as a fuel treatment alternative in the planning area. The belief that fuel treatment can reduce the impacts of wildfires has been common among fire managers for years, has been witnessed in the field, and has been demonstrated by a study completed in northeast Oregon (Schaaf 1996).

The prescribed fire modeling scenarios contain two estimates of current types and levels of prescribed fire activity. The wildfire modeling scenarios also contain two estimates of impacts and were based on average acres burned in actual wildfire occurrence scenarios. An analysis of specific levels of prescribed fire proposed in each alternative could not be conducted.

Particulate emissions and heat release rates were calculated for prescribed fires and wildfires in pinyon-juniper and sagebrush/grassland vegetation areas using the Simple Approach Smoke Estimation Model. A total of four fire scenarios were modeled. The modeled concentration estimates were compared to the 24-hour National Ambient Air Quality Standards for particulate matter (for both PM<sub>10</sub> and PM<sub>2.5</sub>)



## 4.0 ENVIRONMENTAL CONSEQUENCES

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developed under the Clean Air Act. The 24-hour National Ambient Air Quality Standards for  $PM_{10}$  is 150 micrograms per cubic meter. National Ambient Air Quality Standards for  $PM_{2.5}$  has been established at a 24-hour value of 65 micrograms per cubic meter. Threshold values equivalent to these two concentrations were used to evaluate air quality impacts of the prescribed burning and wildfire emissions. Model predictions do not represent worst-case scenarios and are not cumulative impacts of all sources (e.g., mines, power plants, and area sources such as automobiles, trucks, and off-highway vehicles); rather, this modeling analysis evaluated relative impacts of wildfires and management-ignited prescribed fires on a local scale. While this approach is appropriate for an RMP/EIS, it cannot be used to assess impacts of burning on attaining the National Ambient Air Quality Standards at any individual location.

The modeling effort used meteorological data that was representative of the prescribed fire and wildfire seasons. The analysis assumed that prescribed fires would be ignited at 11:00 a.m., which would result in the release of the bulk of the emissions during the unstable daytime hours when vertical mixing would be enhanced and the smoke plume likely would be diluted relatively quickly. Some prescribed fires are active during the stable nighttime hours and have the potential to produce higher ground-level impacts due to lower plume heights and less favorable dispersion conditions. It also was assumed that the size of the source area is equal to the acreage burned, which may tend to over estimate the local dilution of pollutants, particularly during the early portion of the fire. It is thus possible that this analysis under-estimates the amount of particulate matter and subsequent air quality impacts associated with each prescribed burning scenario.

Model outputs include tables showing maximum concentrations of particulates for each scenario. **Table 4.2-1** depicts the relative impacts for several different stability and wind speed categories and compares the predicted concentrations to the National Ambient Air Quality Standards for  $PM_{10}$  (150 micrograms per cubic meter). **Table 4.2-2** depicts the relative impacts for several different stability and wind speed categories for  $PM_{2.5}$  and compares the predicted concentrations to the National Ambient Air Quality Standards of 65 micrograms per cubic meter. Caution must be used in interpreting these results, since the concentrations only can be compared on a relative basis for each of the defined scenarios.

The predicted concentrations of particulate matter for the prescribed fire scenarios are substantially lower than the wildfire scenarios for several reasons: 1) higher fuel moisture levels during management ignited prescribed fires compared to wildfires generally result in less fuel consumed per acre of prescribed fire than per acre of wildfire; 2) smoke dispersion conditions during the spring and fall prescribed burn episodes are better; and 3) prescribed fires are dispersed across the landscape, rather than being concentrated in a few locations. Although a compensating factor is the larger buoyancy and potentially higher plume rise of the wildfire plumes compared to the smaller prescribed fire plumes, the wildfire plumes eventually mix down to the ground and result in higher ground-level concentrations of particulate matter.

Ozone is a byproduct of prescribed burning, but these fires are generally spatially and temporally dispersed, so potential ozone exposures from prescribed fire are infrequent (Sandberg and Dost 1990). Carbon monoxide is rapidly diluted at short distances from a prescribed burn and poses little or no risk to community health (Sandberg and Dost 1990). Other non-criteria, but potentially toxic, pollutants (e.g., polynuclear



**Table 4.2-1**  
**Model Results Showing Relative PM<sub>10</sub> Impacts for Prescribed Fires and Wildfires in Pinyon-juniper and Sagebrush/grassland Burn Areas<sup>1</sup>**

Stability	Wind Speed (miles per hour)	Maximum Concentration (micrograms per cubic meter)			
		Pinyon-juniper Prescribed Fire	Pinyon-juniper Wildfire	Sagebrush/ grassland Prescribed Fire	Sagebrush/ grassland Wildfire
Excellent	1.0	43.4	139.6	88.3	231.9
Excellent	2.0	43.4	142.9	94.2	126.2
Excellent	3.0	43.4	116.3	81.7	86.7
Excellent	4.0	43.4	94.2	68.1	65.7
Excellent	5.0	44.7	78.2	57.3	52.8
Good	2.0	43.3	142.1	88.5	214.6
Good	3.0	43.3	148.9	94.8	146.8
Good	4.0	43.3	136.8	92.0	113.8
Good	5.0	43.4	121.5	84.6	92.5
Good	6.0	43.4	107.5	76.5	77.7
Good	7.0	43.5	95.7	69.0	66.9
Good	8.0	43.5	85.8	62.5	58.8
Good	9.0	44.8	77.6	56.9	52.4
Good	10.0	46.0	70.7	52.1	47.2
Fair	4.0	43.4	144.0	90.0	213.9
Fair	5.0	46.6	149.4	91.4	183.2
Fair	6.0	46.6	149.3	94.6	149.4
Fair	7.0	43.3	144.7	94.6	130.7
Fair	8.0	43.3	138.0	92.5	115.9
Fair	9.0	43.3	130.5	89.2	104.0
Fair	10.0	43.3	123.0	85.4	94.2
Poor	1.0	332.2	479.9	334.5	483.1
Poor	2.0	210.1	302.3	210.7	304.3
Poor	3.0	160.3	230.7	149.4	232.3
Poor	4.0	122.8	190.4	124.8	191.7
Poor	5.0	105.8	164.1	108.5	165.2

<sup>1</sup>The particulate matter (10 microns or less) standard used is 150 micrograms per cubic meter.

aromatic hydrocarbons and aldehydes) are emitted by prescribed burning. These criteria pollutants are not likely to have an impact on public health because of the small levels produced and the rapid dilution or modification of these substances within relatively short time frames. Ozone and carbon monoxide also are produced by wildland fire.

Effects on visibility resulting from smoke production by the various prescribed fire and wildfire scenarios also were assessed using the Simple Approach Smoke Estimation Model. Results indicate that these modeled scenarios would have little impact on visibility at distances of 50 and 100 miles. At lesser distances, increased haziness (a reduction in viewing distance and ability to detect finer features on the landscape) likely would result from the increases in prescribed burning. Large wildfires likely would result in more of the planning area affected by haze. It can be inferred that the higher concentrations of emissions associated with these wildfires would reduce visibility in affected areas more so than the highest levels of prescribed fire. Under Alternative A, there would be a higher frequency of visibility impacts from wildfires, particularly fire use fires, than prescribed burning. There would be many more fire use fires in a given year than prescribed burns.



Table 4.2-2  
Model Results Showing Relative PM<sub>2.5</sub> Impacts for Prescribed Fires and Wildfires in Pinyon-juniper and Sagebrush/Grassland Burn Areas<sup>1</sup>

Stability	Wind Speed (miles per hour)	Maximum Concentration (micrograms per cubic meter)			
		Pinyon-juniper Prescribed Fire	Pinyon-juniper Wildfire	Sagebrush/ grassland Prescribed Fire	Sagebrush/ grassland Wildfire
Excellent	1.0	36.6	126.8	78.3	191.3
Excellent	2.0	36.6	124.6	78.3	115.4
Excellent	3.0	36.6	105.7	71.4	79.9
Excellent	4.0	36.6	87.2	56.2	54.2
Excellent	5.0	37.7	73.1	47.3	43.6
Good	2.0	36.6	126.8	78.3	177.0
Good	3.0	36.6	126.8	78.3	131.4
Good	4.0	36.6	120.1	77.5	102.6
Good	5.0	36.6	108.6	72.8	83.6
Good	6.0	36.7	97.2	63.1	64.1
Good	7.0	36.7	87.2	56.9	55.2
Good	8.0	36.8	78.6	51.6	48.5
Good	9.0	37.9	71.3	46.9	43.2
Good	10.0	38.9	59.8	43.0	38.9
Fair	4.0	36.6	126.8	78.3	176.5
Fair	5.0	39.4	126.8	78.3	151.2
Fair	6.0	39.4	126.8	78.3	130.9
Fair	7.0	36.6	124.5	78.3	114.9
Fair	8.0	36.6	119.9	77.5	102.1
Fair	9.0	36.6	114.3	75.4	91.8
Fair	10.0	36.6	108.3	72.7	83.2
Poor	1.0	280.8	405.5	276.0	398.6
Poor	2.0	177.5	255.5	173.8	251.1
Poor	3.0	135.5	195.0	132.7	191.6
Poor	4.0	111.8	160.9	109.5	158.1
Poor	5.0	96.4	138.7	94.4	136.3

<sup>1</sup>The particulate matter (2.5 microns or less) standard used is 65 micrograms per cubic meter.

**Conclusion.** Air quality in the District is largely impacted by fire management decisions. Short-term impacts of fugitive dust from recreational events also can impact air quality. The existing Ely District Managed Natural and Prescribed Fire Plan would continue to be implemented with decisions regarding individual fires based in part on determination of where in the District fire would be beneficial and where it may be detrimental. Unplanned fires tend to burn hotter and longer than controlled burns resulting in more emissions and potentially worse air quality.

**Alternative B**

**Impacts from Climate and Air Quality Management Direction.** No additional BLM-specific management prescriptions have been identified for the air quality resource under Alternative B. No program-specific impacts for air quality have been identified under this alternative.



**Impacts from Other Programs.** Air quality impacts associated with renewable energy, travel management and off-highway vehicle use, recreation, and mineral extraction activities would be similar to those described for Alternative A.

*Fire Management.* Under Alternative B the existing fire management plan would be refined as needed through the watershed analysis and treatment process to implement the use of fire as a tool to the greatest extent possible. This would result in greater numbers of small fires conducted within the constraints of the fire management plan and in compliance with air quality regulations. Overall air quality impacts are expected to be similar to or less than Alternative A.

**Conclusion.** This alternative would likely result in more small fires and fewer major fires, and may improve air quality in the District.

### Alternative C

**Impacts from Climate and Air Quality Management Direction.** No additional BLM-specific management prescriptions have been identified for the air quality resource under Alternative C. No program-specific impacts for air quality have been identified under this alternative.

**Impacts from Other Programs.** Air quality impacts associated with renewable energy, travel management and off-highway vehicle use, and mineral extraction would be similar to those described for Alternative A.

*Fire Management.* Alternative C involves emphasis on full suppression of all wildland fires. However, this approach is expected to result in increased large fuel loading, higher probabilities of large-scale fire events and potentially major episodes of poor air quality associated with large fires.

**Conclusion.** In the short term, air quality impacts from fire could be lessened over the present. In the long term, air quality is likely to be impacted by greater numbers of large-scale fires producing more emissions.

### Alternative D

**Impacts from Climate and Air Quality Management Direction.** No additional BLM-specific management prescriptions have been identified for the air quality resource for Alternative D. No program-specific impacts for air quality have been identified under this alternative.

**Impacts from Other Programs.** Alternative D would prohibit all permitted, discretionary activities including renewable energy development, recreational activities requiring permits, livestock grazing, and lands and realty actions. Therefore, there would be no impacts for these other programs under this alternative.

*Mineral Extraction.* Alternative D would close the District to leasable and saleable mineral entry. Approximately 4.2 million acres would be open to locatable mineral entry with a reasonably foreseeable demand of 7,500 acres. Therefore, overall impacts to air quality from mineral extraction under Alternative D would be less than those under Alternative A.



## 4.0 ENVIRONMENTAL CONSEQUENCES

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*Fire Management.* Alternative D involves emphasis on minimal suppression of fires except to protect life and property. This alternative would result in a greater frequency of large fires with a corresponding increase in emissions of particulate matter in relation to the other alternatives.

**Conclusion.** Air quality would be impacted in both the short term and long term by an increased probability for occurrence of large-scale fire events.

### Alternative E

**Impacts from Climate and Air Quality Management Direction.** No additional BLM-specific management prescriptions have been identified for the air quality resource. As a result, the program-specific impacts for air quality under this alternative would be identified as common to all alternatives.

**Impacts from Other Programs.** Air quality impacts associated with renewable energy, travel management and off-highway vehicle use, and mineral extraction activities would be the same as described for Alternative A. Recreational impacts would be slightly greater than under Alternative A but less than Alternative C. Fire management would be the same as Alternative B.

**Conclusion.** Alternative E would be similar to Alternative B, in which fire would be used as a tool in vegetation management to the greatest extent possible. This approach would likely result in more small fires and fewer major fires, and may improve air quality in the District compared to Alternative A.



### 4.3 Water Resources

#### Impact Issues – Groundwater

Several groundwater basins within the District have been designated by the Nevada State Engineer for more intensive water rights administration. Demand for municipal and industrial water supplies continues to increase within the state and region. Agricultural water demand and consumption is anticipated to remain relatively constant through year 2020 for the combined Lincoln, Nye, and White Pine county region (Nevada Division of Water Planning 1992). Evapotranspiration consumes a significant portion of the annual groundwater recharge in the District. Significant groundwater withdrawals from rangelands are made by vegetation uptake. Riparian/wetland areas have limited extent within the planning area, and form a small portion of the vegetation treatment alternatives (see Section 2.5.5). Upland woody plant communities also affect groundwater recharge and availability by placing large demands on soil moisture and adjoining groundwater resources. Vegetation composition and spatial distribution can affect infiltration and runoff characteristics, which in turn affect groundwater recharge. Therefore, vegetation management may affect groundwater resources and stream baseflows.

#### Impact Issues – Surface Water

A consideration in watershed-oriented land management is the re-establishment of desirable surface water flow and water quality attributes. Both factors play a major role in ecological health. Stream flows vary in response to the frequency and duration of runoff from snowmelt or rainfall, withdrawals by vegetation and water rights holders, and gains from groundwater. Agricultural withdrawals remove substantial proportions of surface water flows from perennial or intermittent streams. Surface water quality is a function of: 1) discharge into streams, lakes, and wetlands from industrial and agricultural sources, 2) livestock and wildlife use of riparian/wetland areas, 3) soil and rock characteristics, and 4) topography, and 5) riparian and upland plant communities. Industrial dischargers (e.g., mines) are regulated by the Nevada Division of Environmental Protection and required to obtain a National Pollutant Discharge Elimination System permit.

On BLM lands in Nevada, interagency cooperative agreements address water quality issues. Dispersed agricultural discharges are regulated by the Nevada Division of Environmental Protection, Bureau of Water Quality Planning, under the Nonpoint Source Pollution Management Program. BLM has water quality management responsibility (Clean Water Act §313; Executive Order 11514 as amended by Executive Order 11991) for all resource management activities carried out on public lands in the same manner and to the same extent as any non-governmental entity. Through the implementation of best management practices, the BLM prevents or controls, to the maximum extent practicable, nonpoint source pollution and achieves relevant state water quality requirements.

#### Assumptions for Analysis

- Management activities that sufficiently reduce evapotranspiration in areas conducive to groundwater recharge and discharge would encourage greater magnitudes and durations of flows at springs and adjacent stream reaches.



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### Interactions with Other Programs

Water resource management objectives within the Ely District would be incorporated in accordance with clean water act requirements (Clean Water Act §313) into all resource management programs and all proposed actions including: vegetation, wild horses, travel management and off-highway vehicle use, recreation, livestock grazing, woodland and native plant products, geology and mineral extraction, watershed management, fire management, noxious and invasive weed management, health and safety, and lands and realty.

**Goal – Restore and maintain the chemical, physical, and biological integrity of the waters in the Ely District to maintain healthy ecological systems while sustaining multiple uses.**

This goal incorporates the following management direction for water resources:

- Restore and maintain water quality.
- Improve watershed function throughout the planning area.
- Implement, monitor, and evaluate the appropriate Resource Advisory Council (Northeastern Great Basin or Mojave/Southern Great Basin) standards and guidelines to ensure water quality meets state requirements and BLM resource management objectives (BLM manual 7240 Nevada Supplement).
- Ensure that habitats for threatened, endangered, or sensitive species are protected or restored.
- Incorporate, implement, monitor, and evaluate best management practices in all planned or permitted resource management activities.
- Obtain all required federal, state, or local permits pertaining to projects affecting water quality, wetlands, or streams prior to implementing BLM projects.
- Require outside applicants to provide copies of all required permits prior to final BLM authorization.

### Alternative A

**Impacts from Water Resources Management Direction.** Specific management direction applicable to all alternatives is given in Section 2.5.3. The resource goals identified in Interactions with Other Programs provide general resource management direction.

### **Impacts from Other Programs.**

*Vegetation.* Under Alternative A, the historic rate of vegetation treatment of approximately 10,000 acres per year would be increased, but not to the level of Alternatives B, C, or E. The current rate of soil erosion



and associated sediment load in streams may be sustained, but would be most likely to increase over the long term. The current rate of restoration would not keep pace with the loss of perennial herbaceous understory. Surface runoff would continue to accelerate erosion during significant precipitation events, resulting in continued water quality degradation. At the current rate of treatment and restoration, woody species would proliferate. The surface water available for use would continue to decline as a result of reduced infiltration and increased evapotranspiration. Reduction in plant cover following treatment would generate additional erosion until perennial understory cover and near-surface root biomass exceed pre-treatment conditions. Erosion control measures provided in standard operating procedures and best management practices would limit soil erosion and sedimentation following treatment or reseeding. Selective removal of trees and phreatophytic shrubs in and above recharge zones would increase water available for groundwater recharge and base flows.

If conducted over the long term, tamarisk control along stream courses may reduce the phreatophytic consumption of groundwater resources. At selected sites, control efforts would mitigate the trend toward increasing site salinity that occurs under tamarisk as well. Other short-term water quality impacts would be limited since best management practices would be employed and selected herbicides have little soil residual activity and would be used in accordance with the U.S. Environmental Protection Agency label and biological opinion where applicable (Clary et al. 1974; Medlyn 2004). Tamarisk control along stream courses would not be likely to influence salinity levels in the Colorado River. Treatments would continue at comparatively small rates and, more importantly, almost all of the salinity in the river flow originates from geologic and agricultural sources outside the Ely District.

*Wild Horses and Livestock Grazing.* Water is a limiting factor for wild horses and livestock. Concentration of these animals is common around available water sources and contributes to streambank and shoreline degradation, erosion, sediment transport, and water quality degradation. Under Alternative A, these effects would be expected to continue along current trends.

*Lands and Realty.* Land disposals and subsequent development activities could contribute to increased erosion.

*Travel Management and Off-highway Vehicle Use.* Impacts associated with transportation use are expected to increase over time.

*Recreation.* Impacts would be minimized by existing restrictions on recreational activities near drainages, emphasizing the use of existing developed recreational facilities and by limiting motorcycle and truck events to routes subject to NEPA analysis.

*Woodland and Native Plant Products.* The harvest of woodland products (pinyon pine nuts, fuel wood, and Christmas trees) may contribute to water quality degradation in localized areas through increased traffic and increased storm runoff through reduction of canopy interception.

*Mineral Extraction.* It is estimated that about 15,600 acres of the Ely District would be disturbed within the reasonably foreseeable development scenario based on the best available information. Water quality



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potentially could be compromised by fuel or chemical leaks and spills. Implementation of the standard terms and conditions for mineral leasing as presented in Appendix L would minimize these potential effects.

Mining may result in the rerouting and consumption of water. Mining companies would be required by permit to prevent degradation of water resources.

*Watershed Management.* Under Alternative A, the degree of impact on water resources would vary depending on the location and effects of ongoing vegetation treatments. Since current restoration rates do not keep up with increasing plant transpiration demands and the loss of perennial herbaceous understory, sustained springflow and streamflow magnitudes and durations would be expected to decrease. Water quality and watershed health would continue to decline. In the short term, watershed treatment could adversely affect water quality. However, implementation of standard operating procedures and best management practices associated with treatment activities would minimize the impacts on springs, surface water flows, and water quality.

*Fire Management.* Prescribed and wildland fires have the potential to adversely affect water quality due to increased erosion. This potential is substantially reduced with prescribed burns and managed wildfires where appropriate measures are implemented to minimize the effects. Rehabilitation and erosion control also would minimize water quality effects. Under the current program, the diversity of fuel types within watersheds would remain inadequate, and contiguous fuels would proliferate. This would encourage more extensive wildfires, and in some areas, hotter fires having longer duration. Shorter runoff response times, larger peak flows, greater erosion, and increased suspended sediment would likely occur from burned watersheds until rehabilitation efforts were successful. In some situations, fires may contribute to enhanced flow of local springs.

*Noxious and Invasive Weed Management.* The use of herbicides and other chemicals to control or eliminate undesirable plants may affect water quality. Standard operating procedures for herbicide applications are designed to minimize impacts to water quality. Air dispersal and prolonged residence time in soils may lead to contamination of water bodies when herbicides are used over a large area. To minimize this, herbicides selected for use would be applied in accordance with U.S. Environmental Protection Agency labeling and biological opinion where applicable. Over time, most herbicides in soils will degrade.

*Health and Safety.* Chemical spills, or other hazardous materials could adversely affect water quality. BLM has a response plan in place for containment, cleanup, and mitigation of such incidents on the public lands. Neither the probability nor the response to such incidents is expected to change substantially under Alternative A.

**Conclusion.** Since restoration currently does not keep pace with the decline in ecological trends, groundwater recharge and seasonal surface water flows would be expected to decline. Shorter term runoff events (e.g., thunderstorms, snowmelt) would continue to exhibit their current timing and volume, or may occur over shorter time scales and with somewhat larger volumes in watersheds where conditions continue to degrade. Water quality would continue to decline under Alternative A. Evapotranspiration consumption would be expected to increase.



### **Alternative B**

**Impacts from Water Resources Management Direction.** Specific management direction applicable to all alternatives is given in Section 2.5.3 for water resources. Resource goals and activities identified in Interactions with Other Programs provide general resource management direction.

**Impacts from Other Programs.** Water resource impacts associated with lands and realty, woodland and native plant products, noxious and invasive weed management, and health and safety management activities would be the same as described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Vegetation.* The greater rate of vegetation treatments under Alternative B would counteract the trend of expansion of tree species in sagebrush communities and the loss of perennial herbaceous understory species. In addition to higher transpiration demands, these ongoing trends commonly result in greater extent of crusted surface soils and reduced infiltration rates on upland sites. In theory, runoff water quality may improve from selective treatment of overmature pinyon/juniper woodlands, high-elevation conifers, shrub-dominated salt desert shrub communities, and sagebrush sites having little understory. The determination of treatment sites, selection of treatment methods best adapted to a given site, and the application of best management practices would minimize accelerated erosion in the short term. By increasing ground cover density over the long term, treatments also would improve water retention, slowing runoff, and thereby decreasing sheet erosion and suspended sediment. Improved water retention also would lower flood stages, dramatically reducing channel erosion and the risk of other stream channel impacts. The magnitude of these improvements would increase as the proportion of treated area within the District expands over time.

The success of vegetation treatment actions in giving rise to more available water for use depends on many factors, including plant community characteristics, recent precipitation, soil and geologic characteristics, topography, the types of vegetation treatments and restoration activities employed, and the length of time since such activities. Research generally suggests that vegetation modifications are not likely to enhance water yield where mean annual precipitation averages less than about 450 millimeters (17.7 inches) (Hibbert 1983). The majority of upland areas within the District fall into this category, where the potential increases in available soil moisture from vegetation conversion would probably be lost to evapotranspiration. However, soil moisture, groundwater recharge, and stream baseflows would be expected to increase in flow and duration in some locales. These effects would be most likely to occur in the vicinity of springs and streamcourses, through improved infiltration and reduced interception and transpiration by trees and shrubs (Richardson et al. 1979; Wilcox 2002; Eddleman and Miller 1991). This is consistent with past observations on the District (BLM 2004a). Effects on surface water would vary locally and between watershed areas. Springflows may increase, and would be likely to stabilize, preventing further springflow degradation where it now occurs.



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*Wild Horses and Livestock Grazing.* Wild horse and livestock grazing management (e.g., closure to livestock grazing on approximately 3.8 million acres and reduction in herd management areas) would help to reduce stream bank erosion, improving water quality over time.

*Travel Management and Off-highway Vehicle Use.* Road and trail management, and off-highway vehicle restrictions may help to improve water quality.

*Recreation.* Promotion of recreation across a wide spectrum of developed or undeveloped opportunities would create impacts on both surface water and groundwater. Additional overland travel opportunities may affect runoff and water quality. Further development would place greater demand on groundwater resources through pumping, and sanitary considerations may impact groundwater quality.

*Mineral Extraction.* Although minor, constraints on mineral entry and development may somewhat improve water resources compared to Alternative A by closing some areas, new surface disturbance, and water use demands. Leasing constraints placed on some specific lands would benefit water resources locally in comparison to Alternative A.

*Watershed Management.* Watershed restoration would be conducted at increased rates compared to current programs. Implementation of best management practices would minimize water quality impacts.

*Fire Management.* Increased use of prescribed fire and fire use fire under this alternative would decrease the magnitude and frequency of wildfires, thereby reducing water quality impacts. Observations indicate that the use of prescribed fire and fire use fire to reduce shrublands with little understory and overmature pinyon/juniper woodlands also may increase water yield under conditions favorable to groundwater recharge and discharge (Flerchinger and Clark 2003; BLM 2004a; Clary et al. 1974).

**Conclusion.** Water resources would improve under Alternative B because watershed analysis and restoration would take place at an accelerated rate. Localized, short-term increases in erosion and sedimentation may occur immediately following vegetation treatments. Such effects would be minimized by the implementation of best management practices during the treatment process.

### Alternative C

**Impacts from Water Resources Management Direction.** Specific management direction applicable to all alternatives is given in Section 2.5.3 for water resources. Resource goals and activities identified in Interactions with Other Programs provide resource management direction. When carried out, these management actions would maintain or enhance water resources. Increases in water availability (mainly springflows and baseflows) would occur in areas conducive to groundwater recharge and discharge.

**Impacts from Other Programs.** Water resource impacts associated with lands and realty, livestock grazing, noxious and invasive weed management, and health and safety management activities would be similar to those described for Alternative A. Impacts associated with wild horses would be the same as



described for Alternative B. The following interrelated programs would result in different impacts compared to Alternatives A and B.

*Vegetation.* Aggressive treatment programs for sagebrush, high-elevation conifer, and pinyon/juniper community types would improve long-term water resources availability for use in areas conducive to groundwater recharge and baseflow. Effects would be greater than under Alternative B. Shorter runoff response times, greater erosion, and increased suspended sediment would result in the short term, but these impacts would be minimized by controls and rehabilitation efforts.

*Travel Management and Off-highway Vehicle Use.* The decreased use of roads, trails, and off-highway vehicles for increased mineral exploration and development or recreational purposes would reduce the potential for accelerated erosion and water quality impacts from runoff along roads and trails.

*Recreation.* Increased use of existing trails, greater development, special events, and off-road travel emphasis would be expected to result in greater water resource impacts by increasing the potential for erosion and sediment yield along roads and trails, by increasing the demands on water supplies and sanitary systems, and by potentially increasing visitation near springs and streams.

*Mineral Extraction.* Reduction of lands open to exploration and development efforts for mineral extraction would reduce the potential for water resources impacts when compared to Alternatives A or B. Implementation of state or federal standard operating procedures would minimize the effect of industrial activities.

*Watershed Management.* Treatments and forage allocations anticipated in Alternative C are expected to result in water resources effects ranging between those described for Alternatives A and B.

*Fire Management.* Suppression of all wildland fires would encourage heavy fuel accumulations throughout the District. Such accumulations may progress at slower rates where aggressive vegetation treatments and alternative tools and techniques (see Appendix E) other than fire occur. Ultimately, however, wildfires with greater intensities and durations than likely under other alternatives would create impacts to runoff, flooding, and suspended sediment conditions. During the period of full suppression and before widespread wildfires remove the increasingly dense wood vegetation, it is expected that this vegetation would reduce spring discharge and surface flow in numerous locations.

**Conclusion.** In general, long-term improvements in water quality and water resources availability for uses would occur as a result of intensive vegetation management under Alternative C. Increases in water availability (mainly springflows and baseflows) would occur in areas conducive to groundwater recharge and discharge. Water usage and water quality degradation may occur in some areas as a result of increased recreational developments. Over the long term, these effects would be combined with rapid runoff, increased flooding, and greater sediment yield encouraged by the fire suppression approach under this alternative.



### Alternative D

**Impacts from Water Resources Management Direction.** Specific management direction applicable to all alternatives is given in Section 2.5.3 for water resources. Resource goals and activities identified in Interactions with Other Programs provide general resource management direction. When carried out, these management actions would maintain or enhance water resources.

**Impacts from Other Programs.** Water resource impacts associated with noxious and invasive weed management and health and safety management activities would be similar to those described for Alternative A. The following impacts from interrelated programs would likely result from Alternative D.

*Vegetation.* Treatment programs under Alternative D would be limited, with focus on restoration of natural communities. As depicted in Chapter 2.0, different distributions of phases or states would exist among the various plant communities. Overall, vegetation management under this alternative would create only minor increases in the water resources available for use over both the short and long terms. In some woodland settings conducive to groundwater recharge, additional seasonal springflow and baseflow may occur. In other forested and shrub-dominated areas, potential evapotranspiration demands would remain high or increase, reducing the availability of water for other uses.

*Wild Horses and Livestock Grazing.* Under Alternative D, wild horses would proliferate without management controls within herd management areas. Increased grazing and trampling near streams, springs, and seeps would create water quality impacts in herd management areas. Similar effects on uplands would degrade understory conditions, contributing to reduced response times during runoff events, greater erosion, and increases in suspended sediment in and near herd management areas. In contrast, other livestock would be removed from District lands. This would cause more widespread effects on water resources, since greater understory vegetation would increase retention and infiltration on uplands, slowing runoff response times and reducing flooding and suspended sediment concentrations. Grazing and trampling near streams, springs, and seeps would be reduced, improving water quality over a wider area. The net effect on District lands overall would be an improvement in water quality and responses to runoff events.

*Lands and Realty.* No net loss of public lands under this alternative may or may not create impacts on water resources. If lands acquired in exchanges contain areas conducive to groundwater recharge, additional springs or stream baseflows may become available for use. Similarly, if surface water features such as ponds or marshes were acquired through exchanges, water resources availability may increase. The utilization of any water resources increases would depend on allocation of water rights. If, as is most likely, acquired lands do not contain such conditions or features, then increases in water resources availability or improvements in water quality would not be anticipated.

*Travel Management and Off-highway Vehicle Use.* With an extensive land area closed to travel and off-highway vehicles, water quality would improve on the District under this alternative. Little or no disturbance to either drainages or upland settings would reduce emissions and accelerated erosion from vehicle traffic.



*Recreation.* Water quality and availability of water resources for other uses would improve with closure of developed recreational sites and cessation of vehicle events under this alternative.

*Woodland and Native Plant Products.* Management of woodland and native products under this alternative would have little impact on water resources. Although no fuelwood or Christmas tree harvesting would be allowed, the potential impacts on water resources of these approaches would be greatly overshadowed by other resource approaches.

*Mineral Extraction.* The entire district would be closed to saleable mineral entry and leasing under this alternative. It is estimated that 7,500 acres associated with locatable mineral activities would be disturbed according to the reasonably foreseeable development scenario based on the best available information. Water quality improvements are not likely to take place from the absence of further mineral or fluid extraction activities. The potential for water quality degradation from such activities would be avoided; however, such impacts would have been limited by existing regulations.

*Watershed Management.* Treatments and forage allocations described for Alternative D are anticipated to have water resources impacts ranging between Alternatives A and B.

*Fire Management.* Under Alternative D, both heavy and fine fuels would accumulate over the short term. Large-scale, high-intensity fires would eventually occur, probably within a few years. Impacts on water resources would be similar to those described for Alternative C.

**Conclusion.** In general, improvements in water quality and water resources availability for uses would not be extensive as a result of management under Alternative D. Small increases in water availability, primarily in limited areas conducive to groundwater recharge and discharge, would occur. Water quality improvements would occur as a result of recreation and livestock management approaches. Over the long term, however, these improvements would be overshadowed by the fire management approach under this alternative, which would ultimately encourage rapid runoff, flooding, and sediment yield.

### **Alternative E**

**Impacts from Water Resources Management Direction.** Specific management direction applicable to all alternatives is given in Section 2.5.3 for water resources. Resource goals and activities identified in Interactions with Other Programs provide general resource management direction. When carried out, these management actions would maintain or enhance water resources.

**Impacts from Other Programs.** Water resource impacts associated with lands and realty, livestock grazing, noxious and invasive weed management, and health and safety management activities would be the same as described for Alternative A. Impacts associated with watershed management, vegetation, wild horses, travel management and off-highway vehicle use, mineral extraction, recreation, woodland and native plant products, and fire management activities would be the same as described for Alternative B.



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**Conclusion.** Water resources would be improved on a long-term basis as individual watersheds are analyzed and treated to restore vegetation resiliency. During the short term, localized increases in erosion and sedimentation may occur immediately following treatments. The potential for these effects would be minimized by the implementation of best management practices during the treatment process. Increases in water availability (mainly springflows and baseflows) would occur in areas conducive to groundwater recharge and discharge.



## 4.4 Soil

### Impact Issues

Soil resources are fundamental to all land management programs. Soils are inventoried as a critical part of the watershed restoration program and correlated with vegetation in order to identify ecological site potential for management. Soils are managed to minimize erosion and compaction.

### Assumptions for Analysis

Impact assessments for soil resources assume that successful application of vegetation treatments developed for a specific watershed in combination with suitable tools and techniques would enhance soil structure, infiltration and aeration, fertility, and microbial populations.

### Interactions with Other Programs

The soil resource management program within the Ely District potentially would be affected by actions within the resource management programs for vegetation, wild horses, lands and realty, renewable energy, travel management and off-highway vehicle use, recreation, livestock grazing, woodland and native plant products, geology and mineral extraction, watershed management, fire management, and noxious and invasive weed management.

**Goal – Maintain or improve long-term soil quality.** This objective incorporates the following management aspects for soil resources:

- Assess soil suitability and capability as a key component in all resource management decisions including the economic allocation of restoration funds.
- Implement, monitor, and evaluate the applicable Resource Advisory Council (Northeastern Great Basin or Mojave/Southern Great Basin) Standards and Guidelines to ensure protection of soil resources.
- Implement or require use of best management practices to prevent or mitigate potential soil erosion or compaction on all projects.

### Alternative A

**Impacts from Soil Management Direction.** Specific management directions for soil resources are identified in Section 2.5.4, and apply to all alternatives. In addition, the resource goals and activities identified for Soil Resources (see Interactions with Other Programs) further guide management directions. When carried out, these management actions would conserve soil resources, minimize erosion and sedimentation, and maintain or improve long-term soil quality.



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### Impacts from Other Programs.

*Vegetation.* Effective and timely restoration of disturbed areas and achievement of proper functioning condition are both fundamental to soil conservation. The consequences of Alternative A for soils would be directly related to the effectiveness of the vegetation program in meeting its stated goals.

Vegetation restoration activities that remove existing vegetation and involve ground disturbances would result in short-term loss or damage to soil resources. Impacts to soils would vary with the type and extent of disturbance, soil texture, and moisture content. Impacts to soil resources that result from restoration activities are dependent upon the methods used to manipulate vegetation, as well as the slash disposal techniques employed.

Management of vegetation on the District would be for a varied set of objectives under Alternative A. Priorities include treating salt desert shrub communities currently dominated by annual invasive species, and treating sagebrush sites with pinyon and juniper expansion. This strategy would have relatively low impacts to soils in the selected sagebrush communities, because early stages of expansion are low in tree density and have not achieved canopy levels capable of suppressing the understory vegetation. Therefore, in these situations ground disturbances would not be severe and continuous but localized and moderate. There is generally an herbaceous understory present to maintain soil cover. Annual weed control in salt desert shrub communities may generate compaction and erosion impacts to soils if intensive early season grazing is used as a treatment. Treating pinyon-juniper woodlands would not be a priority.

Long-term soil erosion losses are expected under Alternative A as a result of the general trend toward increasing woody species distribution and density in the District. Long-term impacts would result from increasing tree densities that preclude herbaceous ground cover, which often leads to accelerated erosion. Restoration activities also would include determination of causative factors contributing to soil losses and their remediation. At best under Alternative A, the beneficial results would manifest at a low annual rate due to the low level of active restoration. A more likely result is further loss of perennial herbaceous understory and near-surface root biomass on widespread areas of overmature pinyon/juniper woodlands and sagebrush stands. These effects would be likely to accelerate soil erosion.

*Wild Horses.* Under Alternative A, wild horse management would continue in the existing 24 herd management areas, including areas where forage resources are marginal or inadequate to sustain existing herds. Scarcity of forage in these areas contributes to resource damage and accelerated erosion by these herds.

*Lands and Realty.* Lands and realty program administers rights-of-way and special uses on the District, including communication sites and utility corridors. These activities affect soil to the extent that ground disturbances are involved. All permits, leases, and contracts are administered with soil conservation measures such as topsoil salvage and reclamation. The standard operating procedures associated with lands and realty actions are expected to minimize potential impacts to soil resources.



*Renewable Energy.* Soil impacts associated with renewable energy management activities would be the same as described for lands and realty.

*Travel Management and Off-highway Vehicle Use.* Roads are generally the greatest contributor to erosion. Roads serve to drain large amounts of water from the road surface, channel it during peak flow, and scour downstream areas causing erosion and sedimentation into nearby water bodies or basins. The severity of this impact is largely a function of road design, surfacing, geology, vegetation, and topography. Under Alternative A, there are few restrictions on off-road travel. Off-road travel commonly starts as a “two track” that invites further use and eventually leads to a proliferation of roads. This proliferation causes local compaction and increased erosion. Although it may presently occur on a localized basis, increased management activity and human visitation over time could result in more widespread impacts over the long term.

*Recreation.* Management of recreational activities on the District has the potential to concentrate and disperse public use of a large portion of eastern Nevada. Where recreation is concentrated, such as campgrounds, trails, and trailheads, soil compaction is a predictable consequence. Most recreation activities under Alternative A would continue to be dispersed.

*Livestock Grazing.* Management of livestock on rangelands affects soil resources by regulating the extent, intensity, and frequency of herd presence on soil surfaces. These factors significantly influence the potential for grazing to affect soil compaction (by traffic or trampling), vegetation removal (from grazing), and near-surface soil chemistry and microbiology (by animal wastes). The most noticeable impacts occur around water bodies, salt blocks, fencelines, and other areas where animals are frequently concentrated. In such areas, increased soil resource impacts from compaction and increased erosion losses would be expected. In contrast, dispersed distribution and periodic rotation of livestock would be expected to widen the extent of soil resource impacts, including the effects of trampling on biological crusts, but lessen their intensity at any specific location. This would be expected to decrease the overall impacts to soil resources and improve their overall resiliency to grazing effects. However, for any given livestock management approach, the degree of grazing effects on soil resources varies proportionally to the numbers of livestock involved. Under Alternative A, current trends in grazing-related impacts to soil resources would continue.

*Woodland and Native Plant Products.* Off-road activities would occur in relatively small, localized areas as people drive vehicles as close as possible to the products they harvest. This can result in ground disturbances and local compaction where vehicles are used. The fuelwood program includes permit stipulations that generally would limit impacts to existing roads and trails.

*Mineral Extraction.* It is estimated that about 15,600 acres of the Ely District would be disturbed within the reasonably foreseeable development scenario based on the best available information. Therefore, anticipated impacts to soils resulting from mineral development would be limited to less than 16,000 non-contiguous acres. At least one large (greater than 3,000 acres) mine is anticipated, the impacts of which would be evaluated on a site-specific basis.



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The effects of surface disturbance on soils vary based on soil type, texture, moisture content, depth, and slope. Vegetation removal for roads and well pad construction can alter existing drainage patterns and contribute to accelerated gully and rill erosion, especially on steeper slopes. Soil compaction would be expected on areas utilized by heavy equipment for oil and gas exploration, development, and production. Compaction typically is greatest when soil moisture is high and where heavy equipment activities are concentrated. Soil compaction reduces vegetation productivity because it decreases root penetration and water infiltration. Within the State of Nevada, a Memorandum of Understanding for exploration and mining reclamation exists between the BLM and the Nevada Division of Environmental Protection. Reclamation permits are supported by site-specific reclamation plans which are submitted and maintained according to an agency review and approval process. If approved, a permit defines post-project land uses, growth media salvage and replacement, seedbed amendments and erosion controls, site drainage, public safety provisions, roads, recontouring and revegetation practices, post-treatment monitoring, and other site restoration considerations according to best management practices. As a result, and given the comparatively small extent of mineral exploration and extraction acreage in the District, the effects of these activities on soil resources are expected to be minimal.

*Watershed Management.* The current watershed analysis and treatment schedule could influence the accomplishment of soil management objectives. Hence, where soil resources in some watersheds are on a downward trend due to erosion related to factors such as drought; extensive fire; roads; mines; and overly intense, prolonged, or poorly timed grazing; the trend could continue.

*Fire Management.* Fire can affect soils in positive and negative ways. Fire is a natural process that facilitates nitrogen cycling among other important ecological system functions. When this happens, soil nutrient availability for plant growth can be increased following fire. Severe and intensely hot fires, however, can result in hydrophobic and sterilized soils that resist water infiltration and plant production, respectively. Removal of vegetation by fire temporarily reduces plant cover and plant roots for soil stability, leading to erosion and long-term soil loss until revegetation occurs naturally or artificially.

Emergency rehabilitation of burned areas typically is implemented following wildfires. These activities are focused on immediate stabilization of soils to reduce threats to life, property, and natural resources. Emergency rehabilitation includes erosion control measures, seeding, and repair of damaged roads and streams. Fire program emergency rehabilitation and the District vegetation reclamation program collectively would provide the means to achieve soil conservation and improve soil quality on areas where fire rehabilitation occurs.

*Noxious and Invasive Weed Management.* Soil chemical and microbial regimes can be affected by herbicides used to manage noxious and invasive weeds, or other undesirable vegetation. Chemicals used to treat weeds and undesirable brush may enter the soil and remain active for lengthy periods, or may only persist for a few days or weeks (EXTOXNET 1996). This influences the potential for offsite migration by leaching or soil blowing, as well as the potential for animal ingestion or inhalation. In addition, herbicide formulations vary in their strength of adsorption to soil mineral and organic particles (EXTOXNET 1996). This also influences environmental fates and effects, particularly the quality of surface runoff and



groundwater. Once they enter a water body, herbicides vary in their persistence and toxicity to aquatic life (EXTOXNET 1996).

Removal of weeds temporarily reduces plant cover locally. This increases soil vulnerability to splash erosion and sheet flow, particularly on slopes. The potential for corresponding impacts on soil resources depends on such factors as slope, surface texture (including stoniness or gravel veneers), the amount of vegetation cover removed, and the timing of vegetation control activities.

The removal of tamarisk along streams and in riparian habitats on the District may affect soil conditions. Although tamarisk is a nonnative invasive and undesirable species, its root system does provide a soil stabilization role. This is particularly true of dense stands in floodprone settings. Removal of large contiguous areas of tamarisk may contribute to soil erosion and sedimentation as the plant cover and root mass is removed. Related impacts on surface water quality, including salinity contributions, also may occur. To minimize the potential for such effects, the District will continue to employ best management practices in keeping with ongoing tamarisk control efforts (Medlyn 2004). Such practices include, among others, mechanical and bio-engineered streambank erosion controls; consideration of type, timing and extent of control treatments; alternative treatments for overall site stabilization and revegetation; and monitoring.

Soil environments frequently provide an exposure and migration route as well as a degradation mechanism for herbicides. Future land management decisions may involve more widespread herbicide applications within the District. Thus, herbicide applications present a potential impact issue with respect to soils and secondarily, water and other resources. Herbicide use by BLM will follow U.S. Environmental Protection Agency application requirements, biological opinions where applicable, and best management practices. Therefore, effects on soil, water, and aquatic and wildlife resources from herbicide applications are expected to be minimal under Alternative A.

**Conclusion.** Current soils impacts and accelerated erosion losses primarily result from changing ecological conditions within the District. Such factors include reduction in perennial herbaceous understory and widely scattered minor surface disturbances such as those resulting from concentrations of grazing animals, off-highway vehicle use, and various other human activities. Under Alternative A, the effects of accelerated erosion on soil resources would continue their current trends.

### **Alternative B**

**Impacts from Soil Management Direction.** Specific management directions for soil resources are identified in Section 2.5.4, and apply to all alternatives. In addition, the resource goals and activities identified for Soil Resources (see Interactions with Other Programs) further guide management directions. When carried out, these management actions would conserve soil resources, minimize erosion and sedimentation, and maintain or improve long-term soil quality.

**Impacts from Other Programs.** Soils impacts associated with renewable energy and lands and realty activities would be the same as described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.



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*Vegetation.* Under Alternative B, vegetation management would have the potential to increase treatments substantially over current levels, resulting in substantially greater amounts of short-term ground disturbances. Where vegetation modifications interface with cheatgrass understories, herbicides may be used on a wide scale to achieve desired conditions. Other treatment approaches may be selected for application in selected pinyon/juniper, salt desert shrub, and sagebrush communities. In the short term, reductions of vegetation cover and the soil binding effects of plant roots may increase soil vulnerability to runoff and erosion, particularly on slopes. Best management practices and standard operating procedures would minimize potential impacts to soils. With successful treatments, the short-term risks would be offset by increased herbaceous understory and near-surface root biomass in the long term. These factors are expected to reduce long-term erosion and improved soil quality.

For some big sagebrush and Utah juniper communities in the region, research has shown a trend of higher infiltration rates and lower sediment production for treated sites as compared their untreated counterparts (Blackburn and Skau 1974). These results indicate that time is required for a vegetation treatment to make a statistically-significant improvement in infiltration rates. Also, although general trends may improve, if the interspaces between soil and litter accumulations under grass and shrubs already have well-aggregated granular structure, a statistically-significant change in infiltration or sediment yield may not result from vegetation treatments (Blackburn and Skau 1974). Since perennial herbaceous understory cover is declining on the District in areas of encroaching woody species and annual weeds, and since this has been linked to poorer infiltration and unstable soil surface horizons (Blackburn 1975; Blackburn and Skau 1974), selective vegetation treatments over more widespread areas under Alternative B would be expected to improve overall soil characteristics and productivity.

*Wild Horses.* Under Alternative B, herd management would consider the ecological health of areas having marginal or inadequate habitat to sustain wild horse herds. Emphasis would be placed on benefiting soil resources and vegetation communities.

*Travel and Off-Highway Vehicle Use.* The potential effects on soil resources from these activities would decrease from those described under Alternative A, since the overall land planning emphasis would be on ecological system health and resiliency. Constraints on commodity production would likely result in less travel and off-highway vehicle use, with corresponding benefits to soil stability and productivity.

*Recreation.* The potential effects on soil resources from recreation would decrease from those described under Alternative A, since overall land planning would involve constraints on recreation. Less off-road travel and backcountry use would decrease impacts to soils from compaction and erosion.

*Livestock Grazing.* Under Alternative B, livestock grazing would be constrained, reducing the level of impacts to soils.

*Woodland and Native Plant Products.* Under Alternative B, production of these commodities would be constrained, leading to reduction of soil impacts related to traffic and harvesting of woody species.



*Mineral Extraction.* Alternative B would constrain the location of mineral extraction activities in favor of ecological system restoration and improvements in ecological system function. The potential for soil compaction, erosion, removal, and/or productivity losses in more ecologically sensitive areas would decrease correspondingly from those of Alternative A, but the overall level of activity would be similar.

*Watershed Management.* Current trends of soil compaction, erosion, and productivity losses would be mitigated or reversed under Alternative B as a result of the emphasis on site recovery and maintenance. The greater rate of vegetation treatments beyond those included in Alternative A would create greater benefits to soil conservation and productivity.

*Fire Management.* Alternative B would make extensive use of prescribed fire and managed wildfire. As a result, short-term increases in soil erosion rates would be expected, along with short-term increases in nutrient status. In locations where intense fires occur, short-term water repellency may result. The effects of fires on soil erosion would be reduced by implementation of planned fire projects and rehabilitation efforts. Long-term soil quality would improve with greater moisture infiltration as herbaceous cover is restored. As vegetation resilience is restored, fire would be allowed to burn under historical fire regimes and condition classes, resulting in less fire-related impacts to affected soils.

*Noxious and Invasive Weed Management.* Alternative B would increase the rate of weed treatments and herbicide applications, including those used to control tamarisk. As a result, there would be increases in short-term soil erosion and sedimentation. These effects would be minimized by the application of best management practices. Over the long term, soil erosion would be reduced by improvements in perennial plant cover and greater density and extent of near-surface root biomass. The trend of increasing soil salinity in areas invaded by tamarisk would be reduced, and soil salinity in such areas would gradually begin to be mitigated by leaching.

**Conclusion.** Under Alternative B, the scale of vegetation treatment would increase the short-term risk for accelerated erosion in the event of extensive soil disturbance or delays in restoration success. However, the implementation of best management practices, including restoration monitoring, would minimize this impact. On a long-term basis, the erosion potential of restored areas would be diminished, soil quality would be enhanced, and activities contributing to accelerated erosion and sedimentation would be reduced over much of the District. Restoration of vegetation resilience and return to historical fire regimes would result in reduced impacts to soils when fires occur.

### **Alternative C**

**Impacts from Soil Management Direction.** Specific management directions for soil resources are identified in Section 2.5.4, and apply to all alternatives. In addition, the resource goals and activities identified for Soil Resources (see Interactions with Other Programs) further guide management directions. When carried out, these management actions would conserve soil resources, minimize erosion and sedimentation, and maintain or improve long-term soil quality.



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**Impacts from Other Programs.** Soil impacts associated with recreation, lands and realty, mineral extraction, and watershed management activities would be the same as described for Alternative A. Impacts associated with wild horses would be the same as described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Vegetation.* Under Alternative C, soil resource effects from vegetation management would be similar to those described for Alternative B. Short-term erosion and sedimentation would increase above that described for Alternative A, as a result of more extensive vegetation treatments, but long-term erosion is expected to decrease and soil quality is expected to improve.

*Travel and Off-highway Vehicle Use.* Impacts under Alternative C would be similar to those described for Alternative A, except that they would be more widespread as a result of the orientation to commodity production.

*Woodland and Native Plant Products.* The impacts associated with implementing Alternative C would result in management for more woodland products. Soil disturbances caused by harvesting products would increase in size and intensity in woodland areas. Traffic could increase in woodland areas due to the increased availability of desirable products, thereby creating soils impacts. These would be most likely to occur near communities. Permit stipulations would help minimize such impacts by requiring traffic to stay on existing roads and trails.

*Fire Management.* Under Alternative C, all wildland fires would be suppressed. Over the short term, resulting impacts on soil quality would be relatively limited. Over the long term, however, the risk of widespread, uncontrolled, and possibly high-intensity wildfires would dramatically increase. After such events occurred, soil nutrient status would increase and accelerated soil erosion would dramatically increase, with a net reduction in soil quality.

**Conclusion.** Alternative C would involve substantial increases in terms of vegetation treatment. Thus, it would involve short-term erosion risk, but long-term improvement to soil stability and quality. Short-term impacts from management of vegetation and other resources would be minimized by best management practices. Long-term reductions in accelerated erosion may be limited by the emphasis on commodity production.

### Alternative D

**Impacts from Soil Management Direction.** Specific management directions for soil resources are identified in Section 2.5.4, and apply to all alternatives. In addition, the resource goals and activities identified for Soil Resources (see Interactions with Other Programs) further guide management directions. When carried out, these management actions would conserve soil resources, minimize erosion and sedimentation, and maintain or improve long-term soil quality.



### Impacts from Other Programs.

*Vegetation.* Under Alternative D, vegetation would be managed primarily to treat invasive annuals or undesirable exotic species. In the pinyon/juniper woodlands, emphasis would be placed on allowing natural processes to continue on the majority of the acreage, with treatment to limit annual weed occurrence on selected acreage. Protection or management to maintain natural function and prevent expansion of annual weeds would be priorities on salt desert shrub and sagebrush communities. Under Alternative D, overall vegetation treatments would be conducted on less acreage than under Alternative A. In the majority of areas where natural processes are allowed to continue, current trends of erosion and sedimentation and ongoing losses of soil quality are likely to continue although at somewhat reduced rates due to the absence of livestock grazing and other discretionary uses. In many areas erosion, sedimentation, and loss of soil quality could continue at current rates, could diminish with livestock removal, or could increase with greater large-scale fire occurrence. Overall, beneficial effects on soil quality would not be as extensive as under Alternatives B or C.

*Wild Horses.* Potential effects on soil resources under Alternative D would increase beyond those for Alternatives A through C, primarily as a result of the passive management approach to herd management contained within this alternative. Assuming that horse populations would increase under Alternative D and would not be constrained within herd management areas, additional impacts to soil resources (similar to those described for livestock grazing under Alternative A) would be expected to occur.

*Lands and Realty.* Minimal soil impacts would be associated with the exclusion of lands and realty actions.

*Renewable Energy.* Minimal soil impacts would be associated with the exclusion renewable energy management activities.

*Travel and Off-highway Vehicle Use.* Impacts to soil resources would diminish as a result of less travel and off-highway vehicle use under the exclusion of all permitted, discretionary uses and passive management approaches.

*Recreation.* Soil-related impacts from recreation uses would decrease under Alternative D, due to the exclusion of such activities.

*Livestock Grazing.* Soil-related impacts from livestock uses would decrease under Alternative D, due to the exclusion of such activities.

*Woodland and Native Plant Products.* Soil-related impacts from harvesting woodland and native plant products would decrease under Alternative D, due to the exclusion of such activities.

*Mineral Extraction.* Alternative D would close the district to leasable and saleable mineral entry. Approximately 4.2 million acres would be open to locatable mineral entry with a reasonable foreseeable demand of 7,500 acres. Therefore, overall impacts would be less than those under Alternative A. It is



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assumed that existing projects and their disturbances would be allowed to continue as currently permitted, and that they would be closed and reclaimed successfully in accordance with current permit conditions.

*Fire Management.* Alternative D would allow most wildfires to burn with minimal fire suppression except to protect specific areas. Implementation of Alternative D would, therefore, be expected to encourage cheatgrass in the District. Soil conservation is a function of the effectiveness of emergency fire rehabilitation efforts including seeding. It would be feasible for the acreage burned annually in wildfires on the District to increase dramatically under passive management. Cheatgrass would be likely to proliferate. Such an ephemeral cover, having root development and providing limited soil holding capacity during intense precipitation events, would result in increases in erosion and sedimentation.

*Noxious and Invasive Weed Management.* Effect on soil resources under Alternative D would be similar in nature, but more extensive, than those described for Alternative A.

**Conclusion.** Alternative D would involve some increases in rates of vegetation treatment, but with a limited approach and treatment scale. It also would involve limited fire suppression. Thus, Alternative D would create long-term erosion risk, limit long-term benefits to soil quality from vegetation treatments, and enhance erosion risk from major fire events. Erosion-generating human activities such as off-highway vehicle use would be substantially reduced over much of the District, but benefits from limiting these more concentrated activities would likely be offset by more widespread increases in accelerated erosion from major wildfires.

### Alternative E

**Impacts from Soil Management Direction.** Specific management directions for soil resources are identified in Section 2.5.4, and apply to all alternatives. In addition, the resource goals and activities identified for Soil Resources (see Interactions with Other Programs) further guide management directions. When carried out, these management actions would conserve soil resources, minimize erosion and sedimentation, and maintain or improve long-term soil quality.

**Impacts from Other Programs.** Soils impacts associated with wild horses, renewable energy, travel management and off-highway vehicle use, livestock grazing, woodland and native plant products, mineral extraction, fire management, and watershed management activities would be the same as or generally similar to those described for Alternative B. The following interrelated programs would result in impacts different than those of Alternative B.

*Lands and Realty.* Impacts would generally be similar to those described for Alternative A.

*Recreation.* Impacts would generally be the same as anticipated for Alternative B, except that fewer truck events would be permitted and greater motorcycle access would be allowed. Additional erosion would occur.

*Noxious and Invasive Weed Management.* Impacts would be similar to those described for Alternative A.



**Conclusion.** Over the short term, Alternative E would be expected to increase the risk of soil erosion and temporary loss of productivity on freshly treated areas. Implementation of best management practices, including restoration monitoring, would minimize these risks. Long-term reductions in erosion rates and increases in soil quality would be expected with successful widespread vegetation restoration and weed management.







## 4.5 Vegetation

### Impact Issues

Vegetation is a cornerstone of watershed health that is inventoried and correlated with edaphic (soils) characteristics in order to classify ecologically meaningful units for management. With respect to the planning decisions within this document, a large portion of the vegetation management focuses on restoration of degraded ecological systems and management of currently healthy ecological systems that are in jeopardy of becoming degraded. These ecological systems are characterized by highly complex inter-relationships between physical (e.g., air, soil, and water) and biological (e.g., vegetation, wildlife, and fish) dimensions. Actions from all other resource uses affect vegetation and watersheds. In particular, the vegetation resource is strongly affected by livestock, wildlife, wild horses, and fire. The watershed or ecological system restoration involves the implementation of active and passive management actions to achieve specific vegetation conditions necessary for healthy, resilient, and diverse ecological systems.

For purposes of this RMP/EIS, resiliency is defined as the ability of a natural vegetation community to recover following a disturbance such as fire with recruitment of native plants in a manner that eventually leads back to the pre-disturbance condition. Resilient communities typically exhibit perennial herbaceous understory; non-resilient communities commonly exhibit no understory or understories dominated by invasive exotic species.

Species composition, cover, productivity, and spatial arrangement are key characteristics of vegetation communities that affect their quality as habitat for wildlife species. The movement of vegetation communities, especially sagebrush, toward thresholds within the District over the past several decades is now considered by the BLM and other agencies to threaten the welfare, and possibly even continued existence, of selected wildlife species within the District. This situation emphasizes the need for prompt and effective action to reverse the trend of declining ecological health. Actions designed to enhance habitat for wildlife and special status species would be incorporated in the identification of the desired states for vegetation communities.

Active restoration typically involves direct manipulations of vegetation resources, in order to modify shrub composition, reduce shrub and tree density, increase the abundance and diversity of perennial herbaceous understory species, and remove or prevent weed occurrences. Active treatment methods primarily include mechanical, chemical, and fire. Passive restoration is focused on modification of current resource uses or the elimination of activities currently degrading watershed conditions in order to achieve desired states.

Vegetation can be directly affected by treatments and activities of all types. The achievement of the vegetation goal would be affected by the effectiveness of the fire, noxious and invasive weed, wild horses, and livestock grazing management programs in achieving their goals. Impacts to vegetation from management activities or natural events are generally similar to the corresponding impacts to wildlife, livestock, and watershed.



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### Assumptions for Analysis

- The recent patterns of climatic characteristics, including annual variability and directional change (trend toward warmer and drier conditions), are expected to continue over the next several decades.
- Currently available treatment tools and methodologies would continue to be the primary mechanisms for achieving the desired vegetation states.
- Sufficient commercial seed sources of the desired species would not always be available to meet the needs of the restoration program. It is recognized that seed of several desired species may not be available every year and that contingency plans for alternate species may need to be factored into individual watershed treatment plans. (BLM would work with appropriate vendors to ensure that they are aware of the expected market demands.)

### General Impacts from Vegetation Treatment Tools and Techniques

Vegetation treatment tools are summarized in Appendix E along with the tools used in conjunction with various other resource programs. Although it is not practical to provide a detailed impact analysis of each tool within this RMP because of the unique circumstances associated with each application, the following paragraphs provide a general overview of the impacts anticipated from use of each of the major vegetation treatment tools as it would be applied in various vegetation types. In addition to type of treatment involved, the anticipated impacts would logically be affected by the size of area treated, prior vegetation condition, climatic factors, and management following treatment. Although the application of these tools in vegetation treatment directly affects the local soils and subsequent vegetation communities, numerous other resources are either directly or indirectly affected by the selection and use of these tools. Potential adverse and beneficial effects to all resources are considered in the planning of individual watershed treatments.

**Fire.** One of the most practical and economical tools for vegetation treatment, particularly over large areas, is the use of fire, both managed natural wildfires (fire use fires) and prescribed fires. Because of the common differences in effects of these two types of fires, they are discussed separately in this section.

*Managed natural wildfire (fire use).* Wildfires are useful vegetation management tools to the extent that they occur in areas where vegetation treatment is desired and where other resource values are not jeopardized through their occurrence. When fire use fires occur in areas of dense woody fuels such as overmature sagebrush or pinyon-juniper stands, they commonly burn hot enough to kill virtually all of the perennial vegetation, including any remaining understory grasses. Thus, rehabilitation of these burned areas is typically dependent on prompt establishment of seeded perennial grass cover species that can successfully compete with invasive annual grasses and weeds. When fires occur in herbaceous state vegetation, the fire damage is less severe and most existing perennial grass species and some shrub species will recover following the fire event. Depending on the degree to which wildfires kill the existing perennial understory species and seeds in the surface soils, the topographic setting (as it relates to soil moisture availability), and the degree to which soils are scorched and sterilized, effective recovery from such fires may be substantially longer than from other types of treatments.



*Prescribed fire.* Prescribed fire is commonly used to burn areas bordered by some type of natural or manmade firebreak. Such fires may be used in any vegetation state, but are frequently used to reduce heavy fuel loading in areas before such areas ignite. They also may be used to help create substantial firebreaks against major wildfires around communities and isolated private dwellings. In most prescribed fires, the fires are designed and controlled in a manner to limit the severity of fire effects on soil and perennial vegetation species. Depending on the nature of vegetation present before the fire, seeding may or may not be required for rehabilitation of the area. Because prescribed fires typically burn cooler than wildfires (due to size, weather, soil moisture, and other design factors), the recovery time is generally shorter.

**Mechanical Treatments.** Mechanical treatments include such activities as physical cutting and removal of woody plant species, physical disturbance of the soil surface to remove undesired herbaceous species or to prepare a suitable seedbed, and seeding of areas being treated by either aerial or ground-based applications. Any or all of these activities may occur on a given site depending on the existing vegetation conditions relative to the desired range of conditions. Common mechanical treatment tools are discussed briefly below. For a more thorough review of such tools, their primary uses, and their limitations, the reader is referred to texts such as Vallentine (1971) or the recent U.S. Forest Service report by Monsen et al. (2004). Mechanical treatments generally leave an area suitable for prompt seedling establishment and quick recovery.

*Chaining/cabling/railing/brush rolling.* Anchor chains (in some instance with railroad rail segments welded to the chain links), heavy steel cables, or railroad rails are pulled between two crawler tractors operating in a parallel direction to remove or thin shrubs and small trees. These tools typically uproot or break off most mature sagebrush plants and pinyon or juniper trees. Brush rollers pulled by a single tractor may be used in a similar manner in shrub communities. Many immature shrubs and trees are flexible enough to bend under the equipment and survive. Along with thinning of woody species, these tools typically scarify the soil surface to provide a better seedbed for later seeding. The woody debris from these operations provides both ground cover for erosion control and habitat for rodents and other small wildlife species. Impacts to existing herbaceous vegetation are minimal.

*Brush beating/shredding.* These tools are pulled behind a crawler tractor and shred the brush with flails or blades. These applications typically achieve a higher percentage of shrub kill than chaining and similar tools mentioned above while also providing a layer of woody debris as ground cover. They result in low impact to herbaceous vegetation and do not scarify the soil surface.

*Disk plowing.* Heavy-duty disks such as the brushland plow may be used to turn over soil and eliminate small, shallow-rooted species while preparing a seedbed with good ground cover with debris from the previous vegetation. Use of this equipment is typically limited to fairly rock-free sites.

*Manual tree cutting.* The approach of manually cutting individual trees for fuelwood, posts, poles, or other uses may be applied in a limited context to thin overmature stands of pinyon-juniper or other woodland vegetation types. Impacts of this approach are very localized in nature, unless large areas are cut at one



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time. Unusable slash from this harvest may be left in place to act as a soil cover where appropriate, or it may be either removed or burned in place to reduce the accumulation of woody fuels.

*Seeding/interseeding.* Seeding into prepared seedbeds following vegetation treatment or interseeding into existing vegetation communities may be accomplished through aerial broadcasting, drill seeding, or surface broadcasting, depending primarily on the size of area to be seeded, terrain, seedbed conditions, season, and moisture conditions. In areas of suitable terrain and access, seedling establishment is typically more successful with drill seeding because the seeds are placed into rather than on the soil. However, aerial application is more economical in rough terrain or over large areas, as may result from large wildfires. Surface broadcasting, including hydroseeding and hand broadcasting, is most practical in smaller areas, accessible areas of steep terrain, and areas of sensitive erosion control. Although some seeding operations may contribute to localized surface erosion on a temporary basis, longer-term impacts typically arise from the relative success or failure of seedings rather than from the seeding process itself.

**Chemical Treatments.** Chemical treatments primarily involve foliar application of herbicides although a number of herbicides may be used for such applications as soil sterilants and germination inhibitors (e.g., atrazine) and treatment of cut stumps (e.g., 2,4-D application to cut tamarisk stems). For purposes of this planning document, herbicides are grouped into general categories of selective herbicides and non-selective herbicides. Additional herbicides are partially or variably selective depending on the manner and rate in which they are applied. Selection of herbicides for a particular treatment involves not only the expected effectiveness with regard to killing the target plant species, but also the potential for unintended effects to non-target species, effects to other components of the ecosystem including water quality, and persistence in the soil following application. As applied by the BLM in accordance with label instructions, herbicides approved for range use are not hazardous to livestock, wildlife, or humans. The reader is referred to Monsen et al. (2004), Regerh et al. (2005), and Tu et al. (2001) for more thorough discussions of individual herbicides and their uses. Depending on the type of herbicide used, the method of application, and the condition of unaffected understory vegetation, recovery time may be either shorter than or comparable to the time associated with mechanical treatments and prescribed fire.

*Selective Herbicides.* Selective herbicides are those that kill or damage a particular species or group of species with little or no damage to other plants when applied at recommended rates. Common examples include 2,4-D, dicamba, atrazine, and picloram.

*Non-selective Herbicides.* Non-selective herbicides kill or damage all plant species to which applied. One of the most common examples is glyphosate.

*Partially Selective Herbicides.* While these herbicides are used primarily for selected groups of target species, they often have limited effects on non-target species as well. Among these are two of the more effective chemicals historically used in the treatment of cheatgrass and other annual invasive grasses: oust and paraquat.

**Biological Treatments.** Within this planning document, biological treatment such as grazing is typically considered to be passive rather than active treatment because it doesn't involve extensive physical or



chemical alteration of the vegetation communities involved and the effects typically occur at slower rates over extended periods of time, i.e., several years in higher precipitation areas to several decades in desert areas. Grazing management can be manipulated to selectively favor different groups of plant species or to affect overall ecosystem health.

*Type of Livestock.* Because different types of livestock favor consumption of different plants and eat in different manners, the type of livestock may be used to alter vegetation communities. Cattle graze primarily grasses, but also readily eat palatable forbs and some shrubs. Sheep tend to eat more forbs along with various grasses and shrubs. The eating habits of goats are more similar to deer with heavy consumption of forbs and browse. Goats are frequently used in herded situations to control or eradicate populations of noxious weeds that are not consumed by cattle or sheep.

*Season and Intensity of Use.* Season of use may be manipulated to increase abundance of particular species while potentially controlling other species. For example, intensive fall grazing may be used in place of general summer long grazing to promote additional grass seed development and natural seed propagation. The intensive grazing helps to incorporate the mature seed into the soil for later germination. Conversely, intensive spring grazing of cheatgrass-dominated areas may be used to minimize seed development and spread of the species to adjoining areas.

*Other Biological Treatments.* Besides livestock, a number of other organisms have practical application in vegetation management. Among the most common of these is the use of various insects and pathogens for the control of specific weed species. It is expected that use of these tools would increase in future years.

### Interactions with Other Programs

The vegetation management program within the Ely District potentially would be affected by actions within fish and wildlife, special status species, wild horses, visual resources, lands and realty, renewable energy, travel management and off-highway vehicle use, recreation, livestock grazing, woodlands and native plant products, geology and mineral extraction, watershed management, fire management, noxious and invasive weed management, and special designations components of the plan.

**Goal – Where possible, manage vegetation resources to achieve or maintain resilient ecological conditions while providing for sustainable multiple uses and options for the future across the landscape.**

The desired range of conditions associated with the above goal have been defined for the various vegetation communities in Section 2.5.5.

### Alternative A

**Impacts from Vegetation Management Direction.** Under Alternative A, watershed/vegetation treatments would continue to be implemented at rates somewhat above the historic rates of approximately 10,000 acres of watershed manipulation per year. The majority of treatment activity would continue to be



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seeding following wildfires. Watershed restoration treatments would continue to be diverse and varied, including mechanical and chemical vegetation treatments to reduce tree and shrub cover. Prescribed and natural managed fires also would be commonly used to achieve desired vegetation conditions. Tools and techniques used in this and other programs are described in Appendix E. As new tools and techniques become available, they also could be used.

As identified in **Table 4.5-1**, the total area currently estimated for potential treatment in Alternative A is approximately 2,782,100 acres or about 26 percent of the total area occupied by those vegetation communities subject to active treatment. Almost 90 percent of this potential treatment area occurs in the pinyon-juniper and sagebrush types which together constitute approximately 85 percent of the total area within the types subject to treatment. Although specific data regarding the rate of change in ecological health throughout the entire District are not available, the magnitude of area estimated to be at moderate to high risk for displacement of sagebrush and other key native species by less desirable species (Rowland et al. 2003) provides evidence that the current rate of vegetation treatment is not keeping pace with the rate at which conditions are declining. Impacts to vegetation communities resulting from the vegetation treatments would be relatively limited over the short term (next decade) and would gradually increase as more areas are treated over the next 10 to 100 years. The ecological health of untreated vegetation communities outside the desired range of conditions would likely continue to decline in both the short and long term. Woody fuels would continue to increase in these areas with a corresponding increase in risk of wildfire problems over the next several decades until such areas eventually burn naturally.

**Table 4.5-1**  
**Summary of Vegetation Treatment versus Maintenance**  
**by Vegetation Type and Alternative**

Vegetation Type		Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Pinyon-Juniper	Treat	1,149,900	2,766,900	2,766,900	1,868,600	2,766,900
	Maintain	2,443,500	826,500	826,500	1,724,800	826,500
Aspen	Treat	1,400	4,130	4,830	1,050	4,130
	Maintain	5,600	2,870	2,170	5,950	2,870
High Elevation Conifer	Treat	9,600	29,200	44,240	28,000	44,240
	Maintain	46,400	26,800	11,760	28,000	11,760
Salt Desert Shrub	Treat	219,800	219,800	390,700	219,800	219,800
	Maintain	1,001,200	1,001,200	830,300	1,001,200	1,001,200
Sagebrush	Treat	1,348,700	3,090,700	4,214,600	1,461,100	3,090,700
	Maintain	4,270,800	2,528,800	1,404,900	4,158,400	2,528,800
Mountain Mahogany	Treat	6,900	23,000	36,340	25,300	23,000
	Maintain	39,100	23,000	9,660	20,700	23,000
Nonnative Seedings	Treat	45,800	80,800	134,700	29,600	80,800
	Maintain	223,700	188,700	134,800	239,900	188,700
Totals – Above Types	Treat	2,782,100	6,214,530	7,592,310	3,633,450	6,229,570
	Maintain	8,030,300	4,597,870	3,220,090	7,178,950	4,582,830

Under current direction, the variety of vegetation communities present on the District are managed for a wide array of historic uses that sometimes result in conflicts, degradation of the more vulnerable ecological systems (e.g., riparian areas), and loss or reduction of some resources (e.g., reduction in high quality



sage-grouse habitat). Pinyon-juniper woodlands for example, are managed for a variety of objectives such as woodland products, wildlife habitat, and wildland urban interface protection. Each of these is favored by different, and often conflicting, characteristics of the pinyon-juniper communities.

The current management practice of creating small openings by removing pinyon and juniper trees from sagebrush communities where they are present would continue under Alternative A. Very low levels of vegetation manipulation currently are implemented on the District annually, and if continued under Alternative A, current levels of pinyon and juniper removal are unlikely to offset the annual spread of these species that is occurring as a regional trend (see **Map 4.5-1**). Harvest of woodland products also would continue for personal and commercial uses, but such harvests are expected to have very little impact on the overall distribution or abundance of these woodland species. In general, these management practices have very limited effect toward achieving the range of desired conditions for the pinyon-juniper woodland sites and treating pinyon-juniper would not be a priority.

Bartos and Campbell (1998) characterize western aspen as existing in three different condition categories: stable, successional to conifers, and decadent. Many of the aspen stands within the District are considered to be relict stands in existence for the past several hundred years that have been stable until recent decades. Other aspen stands, however, may represent a successional forest type that precedes mixed-coniferous forest types. The third category would be represented by “overmature,” single-aged stands that exhibit no successful regeneration and excessive deadfall. In many cases, aspen stands are vulnerable to expansion of shade-tolerant conifers such as white and Douglas fir, if such species occur nearby. In the absence of fire or other substantial disturbance, the conifers eventually would dominate and replace the aspen. Under Alternative A, management of aspen stands by removing conifers would continue. This has the effect of setting back successional processes to maintain the dominance of aspen in these stands, but does not address the frequent absence of regeneration in these and other stands.

Under Alternative A, riparian and wetland areas would continue to be inventoried and assessed for functional condition as described in Section 3.5. Site-specific measures (e.g., fencing or changes in herd management) would be used on a case-by-case basis to improve riparian conditions. Although localized measures sometimes are effective for improving riparian and wetland conditions, watershed conditions at large also affect hydrologic functioning and sustainability of the wetlands and these would continue to be addressed in a somewhat limited manner as vegetation treatments occur.

*Response to Treatment.* Plant community response to removal of pinyon and juniper and reduction of shrubs is related to the type and amount of treatment, the residual plant species diversity, and site conditions. Production of grass and forb species generally is expected to increase after tree removal and shrub reductions, except where native perennial grasses are absent or at low densities.

Response to treatment is expected to vary with soil type, availability of natural and artificial seed sources (for both desirable and invasive species), and damage to seedlings by grazing or other disturbances. Thus, drought conditions or unplanned grazing damage before seedlings are well established could reduce success and create the need for repeated treatment on the same area. The following typical success rates



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for fire rehabilitation treatments by vegetation type are used by the BLM for planning purposes and are used herein for impact analysis:

- Shadscale 30 percent
- Winterfat 30 percent
- Black sagebrush 50 percent
- Wyoming sagebrush 50 percent
- Mountain sagebrush 70 percent
- Mountain mahogany 70 percent
- Pinyon-juniper woodland 70 percent

In areas where initial treatment is unsuccessful and cheatgrass is part of the vegetation community, cheatgrass is expected to increase rapidly. Thus, cheatgrass eradication may be a necessary step prior to a second revegetation attempt with the desired perennial species. In drier environments where the typical success rates are well below 50 percent, repeated seedings over several years may be required before a suitable stand of perennial vegetation is established to prevent expansion of weedy species.

*Treatments with Fire.* In general, the native perennial grasses are moderately to well adapted to fire and regenerate well following fire. Bunchgrasses with dense accumulations of leaves and stems at their base, such as needle-and-thread grasses, can be vulnerable to fire. Bunting (2002) states that Great Basin wildrye, bottlebrush squirrel-tail, and bluebunch wheatgrass are among the most fire-tolerant perennial grasses while the needle-grasses are among the most fire-sensitive perennial species associated with big sagebrush. Those that survive fire typically can recover within a period of 2 to 3 years. As cited by Monsen et al. (2004), Wright et al. (1979) also list Indian ricegrass, bluegrass, bottlebrush squirreltail, and prairie junegrass as being other fire-tolerant perennial grass species that are common in the Great Basin.

As discussed in Section 4.21, Noxious and Invasive Weed Management, fire can facilitate the spread of cheatgrass over wide areas after the perennial plant community is no longer resilient (see **Map 3.5-6**). Because fires burning woody vegetation are often hot enough to burn most cheatgrass seeds, reseeding immediately after such fires is most successful. Thereafter, control of cheatgrass is an essential element of efforts to revegetate with desirable perennial species. Once established, cheatgrass effectively competes with native perennial grasses and forbs for available soil moisture. Upon drying at the end of its early growing season, it typically provides abundant fine fuels that are easily ignited. However, it does not provide sufficient fuel to produce a fire hot enough to kill its own seeds. This leads to frequent low-intensity fires that help maintain cheatgrass domination of the plant community.

Big sagebrush and other non-sprouting shrubs, such as curleaf mountain mahogany and cliffrose, are almost always killed by fires and may take decades to recover. Various other species such as shadscale, winterfat, and four-wing saltbush will occasionally resprout following fire. Greasewood, on the other hand, will frequently resprout after fires, and species such as horsebrush, Gambel oak, and rabbitbrush are typically enhanced or stimulated by fire (Monsen et al. 2004).



Fire generally kills pinyon pine and juniper. Pinyon pines and junipers rely on seed reproduction, thus the rate of re-establishment is related to the distance to seed source, fire size, and dispersal agents.

Fire use and prescribed fires may be used in some situations (e.g., subalpine areas and aspen stands) for understory burning with limited damage to dominant tree species.

*Treatments with Seeding.* Under Alternative A, both native and nonnative species would be employed in reclamation with an emphasis on native species whenever available. Seed mixes would be developed based on site-specific conditions, such as soils, precipitation, major ecological system, and elevation. The use of both native and nonnative species in reclamation activities (e.g., seeding) potentially can have ecological consequences for the long-term restoration of native plant communities. Nonnative species generally are undesirable if they tend to spread and compete with native perennial species. Desirable nonnative plants typically are species adapted to similar environmental conditions that can be used to meet specific reclamation objectives.

In some situations, it is impractical to achieve direct conversion from a severely degraded condition to a sagebrush-bunchgrass community. A phased approach may be necessary in which the first phase involves treatment of invasive weedy species and establishment of perennial grass cover with an aggressive species such as crested wheatgrass. This nonnative grass stand may then be interseeded (also termed overseeding) with the desired native species including sagebrush, bunchgrass, and forbs (Back et al. 2002). On the other hand, it may be retained for its continued economic and ecological benefits, including its ability to resist invasion by noxious weeds and its functional similarity to native bunchgrass.

Although seeding with locally adapted native species is the preferable approach to seeding, local seed sources are not always available. Seeds of the same species from outside the region may not produce the same results and establish as well as seeds from a local source. However, even local seeds of native species may not be sufficiently competitive where cheatgrass is a problem on sagebrush sites.

#### **Impacts from Other Programs.**

Impacts to vegetation are similar and closely related to impacts to watersheds, soils, wildlife, wild horses, and livestock grazing. Factors that affect any of these resources generally affect all of them.

*Fish and Wildlife.* Wildlife affects vegetation in general through seed predation, trampling, herbivory, and seed dispersal. Together with livestock and wild horses, wildlife presence can affect the success of restoration efforts, particularly if the restoration effort involves a small area. When restoration efforts involve thousands of acres, it is less likely for animals to concentrate in small areas, and the overall effects are expected to be of minor consequence. However, damage may reach problem levels for certain types of vegetation restoration and wildlife (e.g., elk herbivory on aspen restoration areas).

*Special Status Species.* Special status species are not expected to be present in sufficient quantity to directly affect the vegetation program, which could be restricted by conservation measures for these species. However, if additional species become listed under the Endangered Species Act, it is likely that the



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conservation measures developed to protect and restore such species would have a major effect on the type and timing of vegetation treatments allowable within their critical habitats. Such additional listings are considered to be a distinct possibility under Alternative A.

*Wild Horses.* Impacts to vegetation associated with this program would be the same or similar to those described for livestock grazing. Because of their herd behavior and grazing habits, wild horses are more likely than big game species to damage freshly established seedlings.

*Visual Resources.* Visual Resource Management Classes I and II are likely to constrain the types and extents of treatments implemented in various portions of the District. For example, it may not be possible to implement large blocks of mechanical treatment in such areas in a manner consistent with the class descriptions. Under Alternative A, approximately 1.5 million acres are included in these classes.

*Lands and Realty.* The lands and realty program administers rights-of-way and special uses on the District, including communication sites and utility corridors. These activities affect vegetation to the extent that ground disturbances are involved. All permits, leases, and contracts are administered with conservation measures such as topsoil salvage and reclamation of all vegetation disturbed or removed. Thus, most impacts associated with these activities are short term and would be mitigated to the extent practicable through standard operating procedures. Under this alternative, lands identified for potential disposal total slightly less than 29,000 acres, primarily within northern portions of the District.

*Renewable Energy.* Impacts to vegetation associated with this program would be the same or similar to those described for lands and realty.

*Travel Management and Off-highway Vehicle Use.* Transportation management can influence vegetation restoration in a variety of ways that are discussed in other sections of this RMP/EIS. Roadside vegetation receives greater amounts of moisture than surrounding vegetation due to runoff. Transportation routes also are the primary mechanism for invasive plant species to arrive in an area, which then can affect the integrity of native plant communities. Due to the predominance of invasive weeds along roads, the highest levels of herbicides that also may kill and inhibit non-target native plants would be applied along the roadsides.

Under Alternative A, approximately 10 million acres of the Ely District would be open to off-highway vehicle use. Off-highway travel commonly starts as "two tracks" that invite further use and eventually leads to a proliferation of unnecessary roads. This proliferation causes further weed spread, vegetation trampling, and eventual cover loss where local compaction and subsequent erosion occur. Although it may presently occur on a localized basis, increased human visitation over time could result in more widespread impacts to perennial vegetation.

*Recreation.* Management of recreational activities on the District has the potential to concentrate and disperse public use of a large portion of eastern Nevada. Where recreation is concentrated, such as campgrounds, trails, and trailheads, localized vegetation impacts and site compaction are predictable



consequences. Most recreation activities under Alternative A generally would be dispersed; therefore, impacts would be primarily apparent at the particular locations mentioned above.

*Livestock Grazing.* The environmental impacts of grazing are a function of the location, timing, intensity, duration, and frequency of grazing. Grazing animals affect plant communities through herbivory, trampling, and nutrient redistribution. The most noticeable impacts occur around waters, salt blocks, fencelines, and other areas where animals concentrate. Under proper grazing management, these concentration areas are limited in extent and mitigated regularly through management procedures such as movement of salt blocks and water hauls. With improper grazing management, these impact areas are subjected to excessive livestock concentrations year after year in the same pattern.

Grazing can stimulate growth in some plants, aid in the control of some invasive weeds, and sometimes be used to change community composition, structure, and function. On the other hand, grazing can reduce plant abundance, density, and vigor, especially on sandy soils. Differences in livestock use patterns can affect if and when a site will cross an ecological threshold (see Appendix D).

Livestock grazing typically is prevented on freshly seeded areas for the first couple of years because herbivory prior to early root development diminishes plant vigor and reduces seedling survival. Unless prevented, livestock are often attracted to and concentrate on recently treated areas because of the presence of highly palatable young plants.

*Woodland and Native Plant Products.* Woodland and other vegetation products that would be available for personal and commercial uses under Alternative A include pinyon, juniper, mountain mahogany, and desert plants such as cacti. The demand for pinyon and juniper trees and products is low relative to the abundant District supply; therefore, no effects are foreseeable as a result of harvesting. Mountain mahogany is less abundant and more restricted in distribution. Thus, the district-wide harvesting allowed under Alternative A could jeopardize individual populations of this species and affect the associated vegetation from over-harvesting.

Under Alternative A, fuelwood collection would continue to be permitted throughout the District except in closed areas and would not be confined to designated areas. The unrestricted off-highway travel and the open fuelwood collection policy, have high potential to contribute to widespread, low-level impacts to vegetation in terms of creation of new two-track trails, soil surface disturbance, increased erosion, and physical removal or other mortality to trees and shrubs.

Implementation of the woodland products program would result in off-highway activities in relatively small, localized areas as people drive vehicles as close as possible to the products they harvest. This can result in ground disturbances and local compaction where vehicles are used. The open nature of the District woodland products program would continue to broaden the geographic area of vegetation affected by off-highway use. The mostly open fuelwood cutting policy could indirectly assist with achieving healthy ecological conditions in certain small areas (e.g., woodland areas near roads and close to communities, where demand is greatest).



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Under Alternative A, the collection of cactus and succulent plants would remain limited to salvage operations where habitat disturbances are planned. This aspect of the vegetation products program would remain at a low level of activity and have minimal impact to local flora.

Since manual seed collection would be encouraged under Alternative A, the potential to impact vegetation resources from over-collection would be minimized. Where restoration is planned, collection would be restricted 2 years prior to the planned activities to increase the soil seedbank prior to treatment. Local shrub seed collection would generally help ensure the availability of suitable adapted shrub seed supplies for planned treatment efforts.

*Mineral Extraction.* Under Alternative A, the majority of the Ely District would remain open to mineral extraction. Based on the best available information, the reasonably foreseeable development scenario for the District anticipates surface disturbance of approximately 15,600 acres for mineral development and extraction. Therefore, anticipated impacts to vegetation resulting from mineral development would be limited to less than 16,000 non-contiguous acres. At least one large (greater than 3,000 acres) mine is foreseeable, which could have substantial impacts that would be evaluated on a site-specific basis. Most of the impacts would be temporary during the life of the operations with most areas of disturbance being reclaimed following closure of operations.

Exploration drilling and mining activities involve ground disturbances that would require revegetation. Areas of soil compaction that result from mineral exploration, development, and production with heavy machinery can inhibit plant vigor and hamper reclamation.

Vegetation removal for road and well pad construction can alter existing drainage patterns and contribute to the acceleration of gully and rill erosion, especially on steeper slopes. This would result in secondary impacts to surrounding vegetation. Such potential impacts, however, would be minimized or eliminated through application of the terms and conditions presented in Appendix L. Disturbances would be greatest on areas utilized by heavy equipment for oil and gas exploration, development, and production.

*Watershed Management.* Under Alternative A, the watershed treatments would proceed at approximately 10,000 acres per year. This rate has historically been insufficient to offset the current rate of ecological deterioration in the District. Hence, a continued decline in ecological health would be anticipated under this alternative.

*Fire Management.* Fire affects the productivity of plants and has a substantial impact on plant competition. Site-specific impacts are a function of weather conditions, time of year, affected plant species, ecological health, fuel moisture, fire severity, depth and duration of heat penetration, and fire frequency. Site productivity may decrease initially after fire and then increase after one to several years. Total vegetation productivity may shift from woody plants to herbaceous species subsequent to fire, i.e., transition from shrub or tree state to either the herbaceous state or annual invasive state.

Species responses to fire can range from stimulating sprouts to outright mortality. Some plants tolerate fire and some require it. Most vegetation communities in the Great Basin portion of the District are adapted to



more frequent fires than have occurred in the past 100 years. The biggest threat to native ecological systems on the Ely District relative to fire management is the continued proliferation of cheatgrass and other weedy annuals following fire. Current fire management practices take cheatgrass abundance into account whenever practical, and managed fire would remain an important tool in the planned restoration of ecological health, to the extent that such activities would occur under this alternative.

Vegetation response (hence, revegetation potential) following prescribed and managed natural fires varies depending on a set of factors such as fire conditions, timing, pre- and post-fire vegetation, elevation, and post-fire weather patterns. Cool fire areas, where native perennial bunchgrass cover and site productivity are high, frequently can revegetate naturally without seeding. The greatest need for reclamation is in response to wildfires. Hot fires in dense sagebrush or pinyon-juniper stands can result in scorched, water-resistant soils that become unproductive until the condition changes, which could be several years. Extremely severe fires have been known to sterilize soils, whereby productivity is permanently lost. For this reason, vegetation response is strongly correlated with the effectiveness of fuel management.

Under Alternative A, the effects of fire on vegetation have historically been more reactive (rehabilitating areas burned by wildfire) than proactive (using fire extensively to manage vegetation communities), but the current Ely Managed Natural and Prescribed Fire Plan (BLM 2000c) allows fire use over approximately 3.6 million acres of the District. Thus, fire use would be expected to increase over that occurring during the past few decades. However, as vegetation communities continue to decline in resiliency and to accumulate additional woody fuels in untreated areas, particularly in overmature sagebrush and pinyon-juniper communities, the probability of major, uncontrollable stand replacing fires would continue to escalate. Thus, over the long term, substantially greater areas than historically observed may require fire rehabilitation in bad fire years. This effect carries with it the increased probability for major spread and establishment of annual invasive species, particularly in areas where rehabilitation efforts may not succeed on the first attempt.

*Noxious and Invasive Weed Management.* The management of noxious and invasive weeds is essential for restoration of native plant community health and resiliency. If noxious and invasive weeds are not managed on the District and neighboring lands, they would continue to gradually replace more desirable native species throughout the region.

Management to remove, reduce, and prevent noxious weeds includes the use of chemical, mechanical, biological, and cultural methods. The effects of herbicide use vary with the selectivity of the herbicide used, the application rate, and the proximity of non-target plants to targeted ones. The use of biological agents (e.g., sheep and goats) to manage noxious weeds would affect native and desirable plants to the degree that non-target species are present in the treatment area and are palatable to animals. Assuming that standard operating procedures are implemented effectively, these short-term effects are not expected to interfere with the accomplishment of long-term restoration.

The treatment and subsequent removal of noxious weeds contribute to long-term restoration but can require short-term rehabilitation if substantial bare areas result. Herbicides with persistence in soils can adversely affect revegetation success for several years if young plants are vulnerable to the chemicals present.



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As noted above for fire management, the vegetation treatment and management actions of this alternative could result in substantial risk of spread and establishment of invasive species over the long term.

**Conclusion.** The historic rate of treatment (largely fire rehabilitation) each year to restore desirable perennial herbaceous species and restore ecological resiliency would be increased to the extent allowed under the current fire plan. This rate, however, is not considered adequate to match the current rate of ecological deterioration, increase in woody fuel, and expansion of weedy species throughout the District, and substantial long-term effects are anticipated.

### Alternative B

**Impacts from Vegetation Management Direction.** As identified in **Table 4.5-1**, the total area currently estimated for potential treatment in Alternative B is approximately 6,214,530 acres or about 57 percent of the total area occupied by those vegetation communities subject to active treatment. Almost 95 percent of this potential treatment area occurs within the pinyon-juniper and sagebrush vegetation types. Treatments would occur at substantially higher rates and over a broader spectrum of vegetation communities and conditions than under Alternative A. To achieve the desired states for any alternative as described in Section 2.5.5, there would need to be intensive coordination among the various resource management programs that may be affected by the selection and application of treatment tools and subsequent temporary closures or restrictions on various uses.

Except for the Mojave Desert and some salt desert shrub vegetation types, vegetation treatments would occur to restore resiliency and to resist transitions to unhealthy states. Within the sagebrush type, some of the treatment would occur in areas with minimal herbaceous understory. However, most treatments would be applied to areas where the perennial herbaceous understory would be released by the treatment. Across the District, many of the treatments would occur in areas being invaded by pinyon and juniper trees (see **Map 4.5-2**). Where noxious weeds occur, these too would be treated as a high priority. Although of very limited acreage within the District, some of the high priority areas for treatment would include riparian/wetland areas that are non-functional or functioning at risk.

Where invasive species, primarily cheatgrass, dominate the understory, the invasive species would be removed to the extent practicable and replaced with perennial herbaceous species. Effective suppression of cheatgrass is normally impractical with any single treatment approach, including herbicides. Thus, a combination of treatments including appropriate herbicides as well as prescribed fire and specific grazing management practices over a period of several years may be necessary. If treatments were to occur without concurrent efforts to remove invasive species, further proliferation of cheatgrass in the freshly treated areas would have a high probability of occurrence.

Those pinyon-juniper woodland sites that are overmature with tree canopy cover exceeding 35 percent and those having understory vegetation of invasive species would be treated to achieve a range of healthy conditions (see **Map 4.5-3**) and create a mosaic of vegetation communities and age classes that would be more resistant to stand-replacing fires on a large scale. This approach would help ensure the future of these



woodland stands. More limited acreages of treatment also would occur in other vegetation communities where current conditions are not within the range of healthy conditions.

Treatment effects related to wetlands and riparian areas would be more substantial under Alternative B than Alternative A with wetland management and restoration being thoroughly integrated into the watershed analysis and restoration program. Management actions would focus on achievement of specific desired range of conditions, including related wildlife usage, rather than on just achievement of proper functioning condition. Riparian/wetland areas to be treated would likely be treated earlier under this alternative than under Alternative A, based on the types and priorities of treatment within the alternatives.

Application of treatments discussed in the above paragraphs for Alternative B would result in substantial impacts to vegetation communities, both in the short term (where some temporary effects such as increased temporary risk of weed invasion may hamper restoration) and in the long term (where the treatments are expected to result in increased resiliency and improved ecological health). The management approach proposed in Alternative B would increase and focus the restoration activities within the District in a manner to improve both the rate and efficiency of restoring resiliency to degraded vegetation communities. For example, the highest return on effort is anticipated in treating areas that have not crossed a threshold and where the desired plant community is still present but approaching a threshold (see Appendix D). The short-term impacts associated with restoration efforts would include temporary reduction in vegetation cover and productivity, which could impact other resource programs. Moving these communities to an earlier vegetative phase, however, would provide long-term benefits to other resources and users.

Impacts to vegetation in untreated areas outside the desired range of conditions would remain similar to those of Alternative A with potential continued decline of ecological health and accumulation of woody fuels that may later contribute to wildfire problems. Such untreated areas, however, would diminish at a more rapid rate than in Alternative A and Alternative B offers greater flexibility for applying treatment to such areas before they constitute major fire hazards.

Where existing conditions are within the desired range of conditions (see **Map 4.5-4**), vegetation would be managed in a manner to maintain that status. Management of woodlands, aspen, and high elevation coniferous forests would maximize retention of large, old trees as appropriate for the forest/woodland type.

Management within the Mojave Desert and salt desert shrub vegetation types would focus on passive restoration of healthy ecosystems primarily through changes in grazing management to maximize opportunities for natural recovery. The rate and type of vegetation response in these areas would be expected to vary according to current ecological state. Without active treatment, areas with perennial native grasses and forbs present would have greater recovery potential from disturbance than those that are dominated by annual brome grasses and other invasive species. Overall recovery rates expected for Mojave Desert vegetation communities that are currently in poor ecological health would be very slow and it may take several decades for such areas to achieve the desired range of conditions.

**Impacts from Other Programs.** Vegetation effects associated with mineral extraction would be similar to those described for Alternative A. Impacts to vegetation would be similar and closely related to impacts to



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watersheds, soils, wildlife, wild horses, and livestock grazing. The following interrelated programs would result in different impacts compared to Alternative A.

*Fish and Wildlife.* Under Alternative B, the same types of wildlife impacts to vegetation treatment areas would occur as under Alternative A. With a greater area likely to be treated each year under this alternative, the extent of such impacts from wildlife on treated areas also would likely be greater. The vegetation treatment program also would be affected to a greater degree than in Alternative A by the greater emphasis given to wildlife needs in the design and management of vegetation treatments.

*Special Status Species.* Over the long term, the level of restoration effort under Alternative B is expected to substantially slow, if not reverse, the decline in ecological health of watersheds within the District. Thus, the probability of additional species listings under the Endangered Species Act and resultant constraints or mandates related to future vegetation management would be reduced. As with Alternative A, the direct impacts of special status species on vegetation and the vegetation treatment program would be minimal.

*Wild Horses.* Under Alternative B, the number and collective area of herd management areas would be reduced to remove from management those areas where habitat conditions are inadequate to sustain horse populations without damage to other resources. This would reduce potential wild horse impacts to freshly treated areas in those former herd management areas. However, damage by wild horses to freshly restored areas within the remaining herd management areas would be difficult, if not impractical, to prevent unless each individual vegetation treatment area was fenced to exclude the animals. This approach would not be practical on the planned treatment scale.

*Visual Resources.* Visual Resource Management Classes I and II are likely to constrain the types and extents of treatments implemented in various portions of the District. With substantially more acres in Class II and planned treatments under this alternative than Alternative A, this constraint is expected to become more of a factor in treatment planning.

*Lands and Realty.* Approximately 60,000 acres of additional area are identified for potential land disposals under Alternative B beyond the current authorizations under Alternative A. These additional areas are predominantly in the southern portions of the District and primarily would affect areas characterized as shrub lands of either the Great Basin or Mojave Desert regions plus smaller areas of pinyon-juniper woodland, grassland, and barren lands. No substantial riparian or wetland areas are known within the proposed potential disposal areas.

Land disposals could affect vegetation treatments and management on surrounding public lands through increased probability for introduction of weeds from disturbance areas associated with development activities, constraints on use of certain vegetation treatments (e.g., fire) in adjoining lands, and changes in priority of areas to be treated. Affects on lands not adjacent to the disposal areas likely would be minimal. New utility routes would be concentrated in designated corridors, thereby minimizing areas affected by new construction.



*Renewable Energy.* Alternative B includes designation of specific wind energy development areas and solar energy development areas. Although the vast majority of these areas would not be developed for these purposes, the designation of such areas will likely encourage greater development than under Alternative A. Development of such facilities may constrain vegetation treatment decisions in the vicinity or may impose other priorities regarding potential treatments. Constraints of renewable energy development on planned vegetation treatments would be localized and negligible in relation to the overall vegetation restoration efforts. In terms of direct impact to vegetation from such activities, the extent of actual soil and vegetation disturbance associated with installation and maintenance of a wind energy facility is relatively small, even though the overall facility may extend over a large area. These direct impacts would be related primarily to tower construction sites, access roads, and utility corridors. Introduction of noxious or invasive species on these disturbed areas also is a potential impact to vegetation.

*Travel Management and Off-highway Vehicle Use.* Under Alternative B, three areas of limited size would be designated as emphasis areas for off-highway vehicle use. This would substantially reduce the potential for continued wide-spread degradation of vegetation and soils on a watershed basis due to unrestricted vehicle travel. This restriction of off-highway travel except in specific areas would contribute positively to the achievement of vegetation restoration goals.

*Recreation.* Areas designated as special recreation management areas under Alternative B would be approximately three and a half times the area designated under Alternative A and involve a variety of vegetation types throughout the District. These designations are not expected to interfere with vegetation treatment and management, but would be expected to potentially affect the types of treatments involved and the priorities for implementing such actions. Recreational usage of these areas would be one of the factors considered in the planning of vegetation treatments within the designated areas. These sites also may become sites for establishment of noxious or invasive species. These effects would be minor in relation to the overall vegetation restoration efforts.

*Livestock Grazing.* Under Alternative B, livestock grazing effects on vegetation on individual sites would be similar to Alternative A. However, in Alternative B livestock grazing would be discontinued on approximately 3,600,400 additional acres in comparison to Alternative A. Approximately 542,000 acres of this additional closure would be in the Mojave Desert. The entire Mojave Desert area generally would be allowed to recover ecological health through natural processes rather than through active treatment measures. The removal of grazing over much of this area would help facilitate that process. The major closure of over 3,000,000 acres of current and historic bighorn sheep habitat would involve several vegetation types scattered throughout the District. Maintenance of the existing livestock grazing program throughout the watershed/vegetation treatment and restoration process may affect the design and scheduling of treatment areas to minimize impacts to individual permittees.

*Woodland and Native Plant Products.* The effects of this alternative upon vegetation would be similar to that described for Alternative A except that additional species would be made available. Species such as Gambel oak, aspen, white fir, spruce and ponderosa pine would be permitted for green tree harvest on a case-by-case basis in designated areas. Having these harvests in designated areas would facilitate monitoring for undesirable effects to these less common vegetation communities. The inclusion of more



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species on the harvestable list could facilitate achievement of healthy conditions without a major change or increase in treatment efforts.

Under Alternative B, mechanical seed harvesting would be allowed for commercial purposes where such collection would be consistent with watershed and vegetation management objectives. This would most likely affect perennial grasses and shrubs due to their desirability for restoration efforts. Similar constraints on seed collection within 2 years prior to planned vegetation treatments on a given area would apply in Alternative B as in Alternative A. In addition, seed collection would be restricted to prevent harvest of more than half of the available seed for a particular species from any given stand. Thus, effects of seed collection activities under Alternative B would result in increased potential natural reseeding under normal conditions in comparison to Alternative A and comparable reseeding potential in the 2 years preceding vegetation treatments. The degree to which these different seed harvest constraints would actually result in changes in establishment rate for new seedlings would depend heavily on such factors as soil moisture availability, grazing, fire, and other disturbances during the specific years involved.

With the exception of areas dominated by crested wheatgrass, perennial grass deficiencies in the understory of shrub and woodland communities on the District are of critical environmental concern and the focus of watershed restoration goals. Any removal of perennial grass seed beyond that already removed by existing livestock grazing could further hinder restoration efforts on the District.

*Watershed Management.* Under Alternative B, the level of restoration activities would be increased to the limits of available funding/resources and focused on priority areas identified through the watershed analysis process. The plant communities within a given watershed would be treated, if necessary, to achieve the desired range of conditions identified in Section 2.5.5 and managed to maintain that status. Additional forage resulting on areas successfully restored would not be allocated to livestock or wild horses and, thus, could help in further improvement of ecological health beyond meeting the standards for rangeland health. The watershed management approach of this alternative would expedite restoration of vegetation resilience.

*Fire Management.* Fire management under Alternative B would involve fire use (managed natural wildfires) to the greatest extent practicable as a tool in implementing vegetation treatments. Because fire use is one of the most cost-effective tools available for vegetation manipulation, the fire management approach in this alternative would facilitate vegetation treatment and management and enable treatment over greater areas within a limited budget. Thus, fire effects, including subsequent vegetation rehabilitation and restoration, would occur over a greater area during the short term under Alternative B compared to Alternative A due to the extensive use of prescribed fire and fire use fire. Although of low probability, the potential exists for impacts associated with the escape of fire being managed for resource benefit. The nature and severity of such impacts would depend on the circumstances of the specific event. Over the long term, the total areas affected by fire could be comparable for Alternatives A and B due to the expectation of larger, uncontrollable fires eventually occurring under Alternative A. However, the area burned through prescribed and fire use fires under Alternative B is likely to be restored to a mosaic of resilient vegetation communities, whereas achievement of similar desired vegetation conditions following major fires under Alternative A would be much more difficult and less likely. Restoration of vegetation resilience, creation of



vegetation mosaics, and return to historical fire regimes and condition classes would reduce impacts to vegetation during future fire events.

*Noxious and Invasive Weed Management.* Under Alternative B, there would be a substantial increase in level of vegetation treatments with the associated temporary risk of increased spread of invasive species, most notably cheatgrass, in the event of unsuccessful seeding establishment.

*Special Designations.* Under Alternative B, 18 additional ACECs and several other special designations would be authorized. Designation of these areas could impact vegetation resources through constraints on vegetation treatments within or adjacent to each ACEC, depending on the type of resource being protected through the designation.

**Conclusion.** Treatment rates and treated areas would increase substantially beyond current levels, thereby reversing the expansion of annual invasive-dominated communities and the expansion of pinyon and juniper trees into sagebrush communities over the long term. Following restoration treatments, these areas would be more resilient to future disturbance.

### **Alternative C**

**Impacts from Vegetation Management Direction.** As identified in **Table 4.5-1**, the total area currently estimated for potential treatment in Alternative C is approximately 7,592,300 acres or about 70 percent of the total area occupied by those vegetation communities subject to active treatment. Slightly over 90 percent of this potential treatment area occurs in the pinyon-juniper and sagebrush vegetation types. The primary difference in restoration approach between Alternative C and Alternative B is that Alternative C would focus on establishment and maintenance of vegetation communities in a narrower desired range of conditions conducive to the commodity (livestock and big game) emphasis of this alternative. Achievement and maintenance of this desired range of conditions would require greater initial effort and more frequent future treatments. Specific vegetation communities and conditions to be treated would be similar to Alternative B, except for the differences in desired range of conditions identified in Section 2.5.5. This approach would require more frequent future treatments or increased management effort to maintain these more useful communities.

Vegetation impacts resulting from implementing the vegetation treatments of Alternative C would be generally similar to those described for Alternative B, especially in the short term. However, this alternative would involve only limited use of prescribed fire and would rely on more expensive mechanical and chemical approaches for most treatments. Thus, the area successfully treated within comparable budgets would probably be less in Alternative C than in B, eventually leading to substantial differences between the two alternatives over the long term.

**Impacts from Other Programs.** Impacts to vegetation associated with mineral extraction would be similar to those described for Alternative A. Impacts associated with fish and wildlife, special status species, wild horses, visual resources, renewable energy, and special designations would be the same as or similar to



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those described for Alternative B. The following interrelated programs would result in different impacts compared to Alternatives A and B.

*Lands and Realty.* Areas identified for potential disposal under Alternative C are more than three times as extensive as the areas identified under Alternative B. These possible land disposal areas are predominantly in southern portions of the District and would involve primarily shrubland, however there are approximately 200 acres within the area identified that may qualify as wetlands.

Land disposals could affect vegetation treatments and management on surrounding public lands through increased probability for introduction of weeds from disturbance areas associated with development activities, constraints on use of certain vegetation treatments (e.g., fire) in adjoining lands, and changes in priority of areas to be treated. Effects on lands not adjacent to the disposal areas likely would be minimal. Possible land disposals would not affect vegetation treatments and management on the remainder of the District.

*Travel Management and Off-highway Vehicle Use.* Impacts to vegetation under this alternative would involve five off-highway vehicle use emphasis areas with substantially greater total acreage than in Alternative B. Impacts to vegetation on any individual area designated for this use still would be less than those described in Alternative A because off-highway vehicle use would be restricted to designated roads and trails.

*Recreation.* Impacts from recreation on vegetation under Alternative C would be similar to Alternative B, except that the area involved in the nine special recreation management areas is greater than in Alternative B (affecting an additional 630,000 acres, primarily in the Pancake Summit area). This additional area would primarily lie within the pinyon-juniper and sagebrush vegetation types. This greater area designated for recreation would tend to disperse some of the usage in comparison to Alternative B and may reduce the concentration of impacts in localized areas.

*Livestock Grazing.* Impacts of livestock grazing to vegetation would be generally similar to Alternative A, but the focus on commodity production would involve more intensive vegetation management and more frequent treatments than in either Alternative A or B.

*Woodland and Native Plant Products.* Under this alternative, commercial and personal collections of cactus could occur throughout the District without being limited to salvage operations, subject to constraints of Nevada state laws. This policy would invite increased levels of collection for a variety of purposes. The most accessible plant populations would become the most heavily collected, eventually removing an integral part of the local flora commensurate with the areas affected. This increased removal of cactus also could result in increased erosion and probability for invasive weed establishment.

*Watershed Management.* The allocation of additional forage available on restored areas after meeting the Standards for Rangeland Health to livestock could potentially reduce the availability of seed for natural plant propagation in relation to other alternatives where the excess forage may be allocated to wildlife and to enhance watershed maintenance (e.g., Alternative B).



*Fire Management.* Under this alternative, fire would be used in a limited context as a vegetation management tool, and wildland fires would be suppressed to the extent practical. Thus, planned vegetation treatments would involve primarily herbicide applications and mechanical approaches. Due to the greater expense of these methods in comparison to managed natural wildfires, areas treated each year in Alternative C would likely be less than in Alternative B and may not exceed the levels achieved under Alternative A. The fire suppression approach would lead to continued accumulation of heavy fuels in the untreated areas until these areas eventually burned in uncontrolled wildfires. Such fires typically would be hot enough to kill any remaining perennial understory vegetation as well as the woody overstory species. Thus, impacts from fire management could be substantial over the long term.

*Noxious and Invasive Weed Management.* Under Alternative C, there would be a substantial increase in level of vegetation treatments with the associated temporary risk of increased spread of invasive species, most notably cheatgrass, in the event of unsuccessful seeding establishment. With the increased potential for major wildfire events over the long term, this alternative would potentially pose greater long-term risk for invasive species establishment and spread than would Alternative B.

**Conclusion.** Treatment rates and treated areas would increase substantially beyond current levels, thereby slowing and potentially reversing the expansion of annual invasive-dominated communities and the expansion of pinyon and juniper trees into sagebrush communities. Treatments would produce a narrower range of desired conditions than Alternative B, requiring more frequent future treatments. Over the long term, untreated areas would be larger than in Alternative B and would become more vulnerable to major widespread fires. Thus, the long-term impact would likely be comparable to or greater than Alternative A.

#### **Alternative D**

**Impacts from Vegetation Management Direction.** As identified in **Table 4.5-1**, the total area currently estimated for potential treatment in Alternative D is approximately 3,633,500 acres or about 34 percent of the total area occupied by those vegetation communities subject to active treatment. Approximately 91 percent of this potential treatment area occurs within the pinyon-juniper and sagebrush vegetation types, primarily where the understories of these types are dominated by invasive annual species. Alternative D would emphasize minimum management and disturbance of vegetation communities with restoration of historic vegetation such that pinyon and juniper communities and sagebrush communities would be re-established on all sites where they were previously known to occur. Areas where sagebrush has been removed would be revegetated with sagebrush, and similarly, pinyon and juniper would be restored on sites where these species have been removed. Nonnative seedings would be returned to either sagebrush or pinyon-juniper communities.

This approach would attempt to manage public land to achieve no net loss of native communities, where they currently exist or existed in about 1950. The implementation of this alternative would not be consistent with current agency policies and contemporary science regarding ecological processes in the Intermountain West. This management prescription would result in continued proliferation of woody species such as pinyon and juniper within historic sagebrush and grassland dominated sites on the District. It also would



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result in the continued accumulation of heavy fuels in overmature shrub and tree communities until such areas burn through natural fires.

Treatment of riparian and wetland areas would focus on areas with invasive or exotic species, while relying on natural processes for recovery of proper functioning condition in other areas. This would be a slower process than proposed in the other alternatives.

Although this alternative may not result in substantial short-term impacts, the long-term impacts would be substantial with much of the District that is currently occupied by pinyon-juniper and sagebrush being burned and subsequently converted to the herbaceous state or an altered state dominated by invasive annual vegetation

**Impacts from Other Programs.** Impacts to vegetation associated with fish and wildlife, special status species, visual resources, renewable energy, and watershed management activities would be the same as or similar to those described for Alternative A.

*Wild Horses.* Alternative D would involve the same herd management areas as Alternative A, but herd populations would not be controlled within these areas. With annual population increases ranging up to 20 percent, it is expected that most of these herds would soon exceed the habitat capacity and devastate the vegetation resources within these herd management areas. The immediately surrounding areas would be impacted as well when herds moved outside the management areas to find forage until such animals could be removed by the BLM. Impacts would be both short and long term.

*Lands and Realty.* Under Alternative D there would be no net loss of public lands within the planning area. Thus, this alternative would involve less potential land disposal and associated vegetation impacts than any of the other alternatives.

*Travel Management and Off-highway Vehicle Use.* This alternative would eliminate almost all off-highway vehicle use and the associated impacts of such activities to vegetation. Over several years, the trails and other areas currently impacted by these activities would naturally revegetate with a combination of invasive annual species and native species from the surrounding vegetation communities.

*Recreation.* Organized recreational events such as motorcycle and truck races would be eliminated in this alternative and any remnant disturbed areas from past events would be allowed to naturally revegetate with a combination of invasive annual species and native species from the surrounding vegetation communities. The elimination of permits for hunting guides and outfitters in this alternative would reduce the level of backcountry activities and correspondingly, the potential for spread of invasive species into such areas.

*Livestock Grazing.* Alternative D includes total removal of domestic livestock from the entire District. While this would contribute to the recovery of vegetation in situations where improper grazing practices are or have been a primary contributing factor to degradation of vegetation communities, the absence of grazing also would remove one of the important management tools often used for vegetation manipulation, including



weed control. Courtois et al. (2004) found that 65 years of protection from grazing on 16 exclosures at different locations across Nevada resulted in relatively few differences between vegetation inside the exclosures and that exposed to moderate grazing outside the exclosures. Where differences occurred, total vegetation cover was greater inside the exclosures while density was greater outside the exclosures. Protection from grazing failed to prevent expansion of cheatgrass into the exclosures.

During the short term, removal of grazing may facilitate recovery of perennial understory species in those communities where they are abundant enough to provide natural seed sources. Similarly, with reduced levels of herbivory, the amount of residual vegetation production and seeds would be increased with correspondingly increased ground cover (litter). These effects would facilitate seedling establishment of perennial herbaceous species, where they are present and may currently be limited by spring or summer grazing. However, passively allowing plants to grow without livestock herbivory can accomplish only part of what is needed to keep many areas from transitioning across a threshold to a woody dominated state with little resistance to later transitioning to a weedy state.

*Woodland and Native Plant Products.* All harvest of native plant products, except for American Indian collection of pinyon nuts, would be eliminated in this alternative. This action would increase seed availability for natural reseeding, increase accumulation of woody fuels in woodland types, reduce travel and off-highway vehicle use in areas currently used for harvest of plant materials, and reduce potential for spread of invasive plant species in both the short and long term.

*Mineral Extraction.* Alternative D would eliminate most discretionary mineral sales or leases, thereby substantially reducing the total acreages of potential mineral development and associated vegetation disturbances. Approximately 4.2 million acres would be open to locatable mineral entry with 7,500 acres of surface disturbance estimated from a reasonably foreseeable demand scenario based on the best available information.

*Fire Management.* Fire management would involve minimal suppression of approximately 280 fire per year except to protect life and property. This alternative would lead to major widespread wildfires, increased risk for spread of cheatgrass and other invasive species along with a corresponding increase in flashy fine fuels, and resultant increased probability for intense, large-scale wildfires. With the combination of minimal vegetation management and minimal fire suppression in this alternative, it is expected that wildfires would increase dramatically over the long term. Major rehabilitation efforts would be required to prevent the burned areas from becoming dominated by invasive annual grasses and forbs. As a primary result, much of the District that is currently occupied by pinyon-juniper and sagebrush would eventually be converted to the herbaceous state or an altered state dominated by invasive annual vegetation over the long term.

*Noxious and Invasive Weed Management.* The constraints on use of selected herbicides such as the sulfonylurea group under Alternative D would seriously reduce the options for control of cheatgrass on the District since some of the chemicals included in those groups are among the best available for this control. The constraints on herbicide use and the relative absence of fire suppression are expected to result in a substantially increased short-term and long-term risk for spread of cheatgrass and other invasive species.



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*Special Designations.* Since all discretionary uses would be eliminated under this alternative, there would be no need for Special Designations. It is not expected that this change of status (e.g., eliminating the three existing ACECs) would, in and of itself, have any impact on vegetation, especially relative to the other major changes contained within this alternative.

**Conclusion.** Passive management would result in continued proliferation of tree species into historic sagebrush-dominated sites with minimal prospects for restoration of resiliency. Increases in fuel loading in many communities plus minimal fire suppression would lead to widespread fires with the resultant burned areas being converted to the herbaceous state or an altered state dominated by annual invasive species.

### Alternative E

#### **Impacts from Vegetation Management**

**Direction.** As identified in Table 4.5-1, the total area currently estimated for potential treatment in Alternative E is approximately 6,229,600 acres or about 58 percent of the total area occupied by those vegetation communities subject to active treatment. With the exception of treatments related to high elevation conifer where a greater acreage is identified for potential treatment in Alternative C than in Alternative B, the vegetation actions related to this alternative would be generally the same as or similar to Alternative B. Therefore, the impacts to vegetation resources under Alternative E would be the same as or similar to Alternatives B with the exception of this one vegetation type.

**Impacts from Other Programs.** Impacts to vegetation associated with noxious and

invasive weed management activities essentially would be the same as described for Alternative A. Impacts associated with fish and wildlife, wild horses, visual resources, lands and realty, renewable energy, recreation, woodland products, mineral extraction, fire management, and special designations activities would be the same as or similar to those described for Alternative B. Impacts associated with travel management and off-highway vehicle use, watershed management activities, and special designations would be the same as or similar to those described for Alternative C.

*Special Status Species.* Impacts to vegetation from special status species management would generally be similar to Alternative B, except that greater emphasis would be placed on the restoration of habitats for greater sage-grouse and other sagebrush obligate species. This emphasis may affect methods

#### ***RMP Management Focus***

*The restoration and maintenance of healthy ecological systems within watersheds is a primary focus for the future management of the Ely District. Healthy ecological systems are geographically diverse and change over time. They are compatible with soil potential and are resilient to disturbance.*

*Resources and resource uses will be managed to restore or maintain ecological health. Certain resource management changes and active treatments may need to be implemented, in portions of watersheds, to accomplish this objective. Adaptive management will be pursued to avoid deteriorating conditions favoring invasive plants and catastrophic fires. Any projects will be implemented so as to result in a mosaic of vegetation within a watershed.*

*In the long term, natural disturbance (such as drought or fire) will occur and fewer treatments will be needed to maintain ecological health. The result will be a variety of vegetation phases within a watershed, which will provide diverse, healthy conditions for future generations.*



for and prioritization of vegetation treatments. For example, selection of methods may focus on approaches that would thin rather than remove dense overmature sagebrush stands to minimize treatment areas devoid of sagebrush.

*Lands and Realty.* Additional possible land disposal designations proposed under Alternative E would total close to 96,000 acres or slightly more than Alternative B, of which approximately 60 percent would be shrubland.

Land disposals could affect vegetation treatments and management on surrounding public lands through increased probability for introduction of weeds from disturbance areas associated with development activities, constraints on use of certain vegetation treatments (e.g., fire) in adjoining lands, and changes in priority of areas to be treated. Effects on lands not adjacent to the disposal areas likely would be minimal. Potential land disposals would not affect vegetation treatments and management on the remainder of the District.

*Livestock Grazing.* Impacts to vegetation from livestock grazing would be similar to Alternative A, except that an additional area of approximately 3,300 acres would be removed from grazing in conjunction with the designation of new ACECs.

**Conclusion.** Treatment rates and treated areas would increase substantially beyond current levels, thereby slowing and reversing the expansion of annual invasive-dominated communities and the expansion of pinyon and juniper trees into sagebrush communities. Following restoration treatments, these areas would be more resilient to future disturbance, and the presence of vegetation mosaics (as opposed to continuous expanses of sagebrush or pinyon-juniper woodland) would reduce the long-term risk of future devastating fire events.







## 4.6 Fish and Wildlife

### 4.6.1 Aquatic Habitat and Fisheries

#### Impact Issues

For aquatic species and their habitats, the primary mechanisms through which management activities could affect aquatic habitat and aquatic biota include habitat alteration or loss, sedimentation due to soil disturbance and vegetation removal, water quality changes, and reductions in surface water quantity. The focus of the analysis was on surface water habitat (i.e., perennial streams, springs, wetlands, reservoirs, or lakes) with persistent year-round flow or water availability.

#### Assumptions for Analysis

None.

#### Interactions with Other Programs

The fish and wildlife management program within the Ely District potentially would be affected by actions within the resource management programs for water resources, vegetation, wild horses, lands and realty, renewable energy, travel management and off-highway vehicle use, recreation, livestock grazing, woodland and native plant products, geology and mineral extraction, watershed management, fire management, noxious and invasive weed management, and special designations.

**Goal – In cooperation with the Nevada Department of Wildlife, manage suitable aquatic habitats to sustain nonnative fisheries and minimize conflicts between nonnative and native fish species. (Bonneville cutthroat trout are discussed under Special Status Species.) Native nongame fisheries are discussed in the Special Status Species section.**

#### Alternative A

**Impacts from Fish and Wildlife Management Direction.** The BLM would manage aquatic habitat to maintain previously established nonnative fisheries in streams and reservoirs in cooperation with the Nevada Department of Wildlife. BLM management is limited to habitat maintenance, while the Nevada Department of Wildlife is responsible for managing fish populations and their habitat. Management would be designed to sustain nonnative game fish species (primarily rainbow trout). Stocking programs would continue to be the primary method in sustaining nonnative fisheries in reservoirs and streams that do not contain spawning habitat. For fisheries located on BLM land, habitat quality would be maintained by following Resource Advisory Council standards and guidelines that protect riparian vegetation, bank stability, and channel morphology (Appendix A). A list of game fish species by water body is provided in **Table 3.6-1**. The result of management for nonnative game fish species could result in conflicts with native fish species. These conflicts could involve reduction in preferred habitat for native species, or species interactions involving competition for food, cover, or spawning areas. Conflicts between nonnative and



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native fish species would be addressed on a case-by-case basis for a specific water body. Special riparian use restrictions or limitations would be implemented on a case-by-case basis to protect nonnative fisheries.

### Impacts from Other Programs.

*Water Resources.* Management of water resources is covered under the water resources program. Additional actions that could occur as part of water resource development include water rights acquisitions and water supply. If these actions propose to use water sources that affect surface water quantity, reductions in flow or water levels could adversely affect nonnative fish species.

*Vegetation.* Vegetation treatments conducted on the District from 1990 through 2003 mainly involved fire rehabilitation seeding and limited mechanical and prescribed fire treatment on an average of approximately 10,000 acres per year. Vegetation treatments could result in soil disturbance and localized erosion. If the treatment site is located within the drainage area of a perennial stream, sediment could enter the water body during runoff. Any effect on nonnative fish habitat is expected to be short-term in duration and localized in terms of the affected area. Long-term improvements to fish habitat would occur as understory shrubs and grasses recover in the treated area and provide overhanging cover along streams. Seeding is not expected to affect fish species and their habitat. The effects of burning are discussed in this section under fire management.

*Wild Horses.* Six herd management areas overlap with one or more perennial stream segments containing nonnative game fish species. These include Buck and Bald Herd Management Area (Huntington Creek), Cherry Creek Herd Management Area (Goshute Creek and Paris Creek), Butte Herd Management Area (Cherry Creek and Egan Creek), Seaman Herd Management Area (Forest Home Creek), Wilson Creek Herd Management Area (upper Meadow Valley Wash) and the Clover Mountains and Clover Creek herd management areas (Clover Creek). Surface disturbance and loss of vegetation could occur in these areas, especially as horses concentrate near water sources. Horses could directly affect aquatic habitat by disturbing stream substrates and bank vegetation. Fish could be affected due to habitat alteration, removal or reduction of riparian vegetation, and localized increased sediment. The level of impacts is expected to continue at present levels under Alternative A.

*Lands and Realty.* Under Alternative A, possible land acquisitions and disposals would continue to occur for a variety of management purposes. Examples include the Lincoln County land sale and lands subject to the Federal Lands Transaction Facilitation Act (Baca Bill). Potential impacts on aquatic habitat and nonnative fish depend on the type of activity proposed for the land. If new surface activities occurred on the land, aquatic habitat could be directly altered or indirectly affected due to increased sedimentation and contamination in runoff. Permit requirements under the Clean Water Act would minimize potential impacts to perennial streams by implementing erosion control, storm water runoff, discharge, and spill control measures. Land activities could require the use of water from a perennial stream, which could reduce the amount of habitat available for nonnative fish species. The magnitude of the impact would depend upon the volume of water withdrawn.



*Renewable Energy.* The development of wind or solar energy resources or utility corridors would result in surface disturbance during facility construction and access to the sites. If the facilities are located in perennial drainages with nonnative fish species, increased sedimentation could affect their habitat.

*Travel Management and Off-highway Vehicle Use.* Use of existing transportation corridors could result in short-term, localized sediment input to perennial stream segments containing nonnative and native fish species. The primary mechanism for sediment effects would involve off-highway vehicle use adjacent to or within stream channels. Soil disturbance from vehicle use could result in sediment runoff from roads into adjacent streams or springs. The maintenance and possible upgrade of existing road corridors near water bodies could result in sediment input due to surface disturbance. By implementing required erosion control measures during construction, sediment impacts to streams would be minor. Impacts are expected to continue at present levels under Alternative A.

*Recreation.* Recreation activities under Alternative A could result in vehicle traffic and hiking near perennial streams containing nonnative and native fish. Vehicle use could result in localized sediment input to streams, as described for travel management. Recreational fishing also would occur in streams with game fish species (mainly trout). Fishing regulations and stocking efforts to supplement populations in the more popular streams would be determined by the Nevada Department of Wildlife. Fishing regulations are designed to maintain a recreational fishery in the streams and minimize effects of heavy fishing pressure.

*Livestock Grazing.* All perennial stream segments containing nonnative fish species occur within Ely District grazing allotments. In most instances, only one perennial stream segment is located within a particular grazing allotment. However, four allotments (Cherry Creek, Smith Creek, Baker Creek, and Geyser Ranch) contain two or three perennial segments within the allotment boundaries. The types of impacts resulting from grazing activities on nonnative and native fish and their habitat include erosion and sedimentation due to surface disturbance. Compared to wild horses, grazing activities potentially could affect all perennial streams, since grazing allotments encompass the entire Ely District and grazing management must meet standards for riparian health, which would reduce effects to riparian vegetation (see Resource Advisory Council Standards and Guidelines, Appendix A). Impacts are expected to continue at present levels under Alternative A.

*Woodland and Native Plant Products.* The harvest of vegetation products for public and commercial use could result in impacts to native and nonnative fish, if activities occur within the drainage area of streams containing fish. Woodland products are obtained from evergreen forests, which are scattered mainly in the central and eastern half of the Ely District. Numerous streams in White Pine County are located within evergreen forest areas where potential harvests could occur. These streams include Cold, Goshute, North, Cherry, East, Eightmile, Willard, Geyser, and South Fork Willow creeks. One stream in Lincoln County, Clover Creek, also is located within evergreen forest vegetation. The types of impacts that could result from firewood cutting, Christmas tree removal, and pinyon pine nut harvesting include increased erosion and fuel spill risks. Tree cutting in areas near streams could remove a source of woody debris and contribute to increased short-term erosion and sedimentation. Removal of riparian canopy above streams also could result in increased water temperatures. Activities would not be allowed within the perennial stream channels, and therefore, would not directly alter habitat. The magnitude of potential impacts would



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depend upon the proximity of the harvest area to the perennial stream, extent of surface disturbance, and drainage characteristics such as gradient and extent of vegetation cover.

*Mineral Extraction.* Potential oil and gas development could occur within active lease areas, which overlap with four game fish streams (Duck, Illipah, Huntington, and East creeks) and one reservoir (Illipah) in White Pine County. No fish streams overlap with active leases in Lincoln or Nye counties. If future development occurred in the drainages associated with these water bodies, potential effects on nonnative fish and their habitat could occur. Surface disturbance activities associated with mineral development could include construction of access roads and site facilities and operation of the mine or wells. Impacts could include increased sedimentation, water withdrawals, and water quality contamination due to leaks or spills of fuel or other chemicals used during operation. Water quantity also could be affected if water is withdrawn from surface water sources. Potential impacts to fish from these activities could include loss or alteration of habitat, changes in water quality, and removal of riparian vegetation. Potential impacts would be minimized by implementing lease stipulations and standard operating procedures that protect water quality and quantity and associated habitat conditions.

Fish habitat also could be affected by geothermal development. Potential impacts to fish habitat could include surface disturbance and increased sedimentation for construction of roads and production facilities. Geothermal development also could reduce surface flows.

Mining for metals would not be expected to affect fish habitat or fish species in the Ely District. This conclusion is based on a comparison of high potential occurrence of metals to fishable stream segments. No stream segments are located within the high mineral potential areas.

*Watershed Management.* The current approach of watershed management would continue under Alternative A. The process establishes procedures for determining the current physical and biological conditions of a watershed, which in turn evaluates its ecological health. To date, nine watershed analyses (Antelope Valley, North Antelope, Clover Creek South, Gleason Creek, North Spring Valley, Smith Valley, South Steptoe, Spring Valley, and Steptoe A) are in progress with completion scheduled for 2006. Other watershed analyses are scheduled for completion in the next 10 years. As these assessments are completed, various adjustments in resource management would be implemented to ensure that appropriate watershed, vegetation, and water quality standards are met. It has been speculated that continuation of the historic management in watersheds could result in reduced water quality and quantity and degradation of riparian zones (Perryman et al. 2003). In the long term, the watershed analyses and restoration treatments would help to improve aquatic habitat for nonnative fish species by improving preferred future condition and riparian vegetation. Numerous standard operating procedures are part of the watershed restoration program to protect surface water quality in terms of sedimentation and possible contamination from various activities. The types of factors affecting aquatic habitat and species are discussed in the various interrelated programs. Restoration of all identified treatment areas would take many decades under this alternative.

*Fire Management.* Fire use fires and prescribed burning would continue to be used in combination with other resource programs to actively reduce fuels within the Ely District. Where burning occurs adjacent to streams, the effects on stream environments would be the short-term loss of understory and woody debris,



which provides cover and shading for nonnative fish species. Within several years, vegetation would recover along the streams and provide cover attributes with a lower fire risk.

Wildfires would continue to occur throughout the District and would be managed in accordance with the existing fire management plan, which identifies areas where such fires would be suppressed versus not suppressed. In areas where wildfires occur, increased erosion and sediment input to streams could result due to the loss of vegetation.

*Noxious and Invasive Weed Management.* Noxious and invasive weed management activities would result in varying effects on aquatic habitat and nonnative and native fish depending upon the type of activity. In terms of chemical treatment, potential toxic effects on aquatic species would be avoided by following standard operating procedures, which establish buffer zones to water bodies, identify nontoxic chemicals for use near water bodies, and define preferred conditions for application (e.g., calm versus windy conditions). Potential toxic effects could occur if an accidental chemical or fuel spill or leak entered a water body containing fish species (BLM 2000e). The mechanical removal of weeds would result in soil disturbance, which could contribute increased sediment input into water bodies during runoff events. Increased sediment could alter fish habitat by covering bottom substrates and reducing spawning habitat or adversely affecting macroinvertebrate food sources for fish. The duration of sediment-related effects would be short-term in duration (i.e., several months to several years until new vegetation is established).

The eradication of tamarisk along streams would remove overhanging cover that provides shade and streamside structure. Removal of tamarisk also could result in localized sediment increases due to reduced bank stability. After new vegetation is established in several years, cover and bank stability would be replaced along the stream. Removal of tamarisk would potentially increase water quantity in streams. Tamarisk consumes relatively high amounts of water compared to other herbaceous or non-riparian species.

*Special Designations.* Management areas for two existing ACECs (Beaver Dam Slope and Kane Springs) would not overlap with perennial streams and springs. The Mormon Mesa ACEC overlaps with Meadow Valley Wash. However, there are no riparian or other stipulations that would affect habitat for fish species. No new areas would be proposed under Alternative A.

**Conclusion.** Fisheries management would focus on sustaining habitats for nonnative fisheries by following Resource Advisory Council standards and guidelines. Conflicts with native species would be handled on a case-by case basis. Other programs could continue to affect habitat for nonnative fisheries as a result of sedimentation, vegetation removal, and habitat alteration due to surface disturbance. Upland areas would continue to degrade in terms of vegetation loss and erosion, which would indirectly affect riparian areas along streams and springs. Land and realty actions (e.g., rights-of-way or disposals) could involve subsequent changes in demand for either surface or groundwater resources throughout the District with resultant effects to aquatic habitat as a result of flow or water level changes.



### Alternative B

**Impacts from Fish and Wildlife Management Direction.** The BLM would manage aquatic habitat to maintain and enhance previously established nonnative fisheries in streams and reservoirs in cooperation with the Nevada Department of Wildlife. Where nonnative species already exist, habitat objectives would be based on the requirements of native fish species. Under this alternative, decisions would be made by the Nevada Department of Wildlife in consultation with the BLM on whether to establish new nonnative fisheries. Livestock utilization levels and special use restrictions would be enacted as baseline management for the established nonnative fisheries in the planning areas. The objective would be to identify if livestock are the causal factors for non-attainment of standards and guidelines. Corrective actions to livestock management or exclusion of livestock use in watersheds would occur until management objectives are met.

**Impacts from Other Programs.** Impacts to aquatic habitat and nonnative fish species from water resources, woodland and native plant products, and noxious and invasive weed management activities would be the same as described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Vegetation.* Since vegetation treatments would increase as part of this alternative, potential short-term erosion could occur in the disturbed areas. If treatment sites are located within the drainage area of a perennial stream, sediment could enter the water body during runoff. Any effect on fish habitat is expected to be short-term in duration and localized in terms of the affected area. Water temperature increases also could occur in stream segments where riparian canopy is removed. In the long-term, additional vegetation treatments could improve fish habitat conditions through soil and water retention, stream bank stability, and overhanging cover from riparian vegetation.

*Wild Horses.* Potential impacts to aquatic habitat and fish species in two herd management areas, which overlap with one or more perennial stream segments (Triple B Herd Management Area [Huntington, Goshute, Paris, Cherry, and Egan creeks], and Eagle Herd Management Area [Meadow Valley Wash]) would be the same as described for Alternative A. Potential impacts in Clover Creek would be eliminated due to the elimination of two herd management areas (Clover Mountains and Clover Creek).

*Lands and Realty.* Two streams (Duck Creek in White Pine County and Clover Creek in Lincoln County) are located within possible land disposal areas for Alternative B. The types of impacts that could affect nonnative fish and their habitat as a result of these potential land disposals would be the same as described for Alternative A.

*Travel Management and Off-highway Vehicle Use.* Effects of travel management on fish habitat could be reduced because off-highway vehicle use in management areas would need to be consistent with protection of resources including fisheries.

*Recreation.* Recreation activities under Alternative B would increase due to additional special recreation management areas. Dispersed recreation could result in surface disturbance and additional



fishing pressure on perennial game fish streams and reservoirs. However, the management approach would be to minimize effects to water bodies located within recreation areas.

*Livestock Grazing.* Under Alternative B, livestock grazing management would be consistent with maintaining and restoring watershed function and health subject to modification associated with potential disposal actions. Intensive management of livestock also would be used as a tool to accomplish restoration on a short- and long-term basis. By removing grazing on approximately 3.5 million acres, erosion and loss of riparian vegetation would be reduced in numerous drainages. This management approach could improve habitat conditions for fish by increasing vegetation development in riparian areas.

*Mineral Extraction.* Under this alternative, oil and gas development are projected to occur on approximately 7,100 acres in areas with a high potential category. A comparison of the high potential oil and gas areas to fish streams indicated that development could occur within the following drainages: White Pine County (Huntington, Duck, Tailings, South Fork Willow, North, Geyser, Willard, Silver, Baker, and Big Springs creeks), Lincoln County (Meadow Valley Wash), and Nye County (Cherry, South Fork Cottonwood, Forest Home, and Pine creeks). Although the amount of potential oil and gas development is relatively small, it could occur in a larger number of drainages. If development occurred in these drainages, the types of potential impacts would be the same as discussed for Alternative A.

The effects of geothermal development and mining on fish habitat would be the same as discussed for Alternative A.

*Watershed Management.* Fish habitat concerns regarding riparian development and stream bank stability would be identified under this alternative by increasing the number of watershed analyses that would be conducted per year and the inclusion of all 4th level hydrologic units in the assessments. The impacts of watershed management on fish habitat and fish species would be the same as Alternative A, except that the rate of completion of watershed assessments and implementation of watershed restoration plans would be substantially increased. These activities would improve riparian habitats and stream bank stability.

*Fire Management.* The use of fire as a vegetation management tool would increase substantially under Alternative B. It is expected that a greater total area (and more streams) would be affected by fire under Alternative B than Alternative A. In the short term, fire use fires and prescribed fires would consume fuel that could otherwise accumulate, potentially resulting in severe watershed effects due to higher burn temperatures in uncontrolled wildfires. Short-term erosion and sedimentation effects would likely occur following managed natural wildfires and to a lesser extent following prescribed fires.

*Special Designations.* The designation of additional ACECs under Alternative B (e.g., Condor Canyon and Lower Meadow Valley Wash) would reduce impacts to streams with nonnative and native fish as a result of restricted activities in stream channels. Surface disturbance to the watershed would be reduced by limiting or eliminating new rights-of-way, off-highway vehicles, road maintenance, and new roads. These impacts would be long term, since it would take at least several years or longer to improve habitat conditions.



**Conclusion.** Fishery management would result in maintenance and enhancement of habitat parameters involving riparian vegetation. Most of the same programs discussed in Alternative A also could affect fish habitat as a result of sedimentation, vegetation removal, or habitat alteration. Vegetation management would result in greater short-term impacts through erosion and vegetation removal as a result of increased treatment areas. On a long-term basis, these habitats would be improved along with the improvement of vegetation resilience and ecological health in the nearby riparian and upland areas. Fish habitat could be improved in Meadow Valley Wash and Clover Creek due to the ACEC designations and elimination of wild horses, respectively.

### Alternative C

**Impacts from Fish and Wildlife Management Direction.** Aquatic habitat fisheries management activities would be similar to Alternative A except that nonnative fisheries would be enhanced and conflicts between nonnative and native fisheries would be mitigated.

**Impacts from Other Programs.** Impacts to aquatic habitat and fish species associated with water resources, renewable energy, livestock grazing, woodland and native plant products, geology and mineral extraction, and noxious and invasive weed management activities would be the same as described for Alternative A. The effects associated with wild horses, lands and realty, travel management and off-highway vehicle use and special designations management activities would be the same as described for Alternative B. The following interrelated programs would result in different impacts compared to Alternatives A and B.

*Vegetation.* Under this alternative, additional areas would be treated, which could result in a potentially higher level of erosion during the short term on a district-wide basis than under Alternative A. The increased level of treatment also could affect additional riparian vegetation. A wider area of riparian vegetation could be treated as part of the restoration under Alternative C, which would be beneficial to aquatic habitat.

*Recreation.* Recreation activities under Alternative C could result in increased use from additional special recreation management areas. However, the management approach would be to minimize effects to water bodies located within the recreation areas.

*Watershed Management.* The impacts of watershed treatments and management on fish habitat and fish species would be similar to Alternative B.

*Fire Management.* Because Alternative C involves minimal use of prescribed burns and full suppression of wildfires, accumulation of heavy fuels would continue throughout the untreated areas of woodland and shrub communities. This would ultimately result in a higher frequency of intense fires when these dense woodlands or shrublands finally burn. Erosion and sedimentation impact to streams would be greater in such areas.



**Conclusion.** Management of nonnative fisheries would implement mitigation to resolve conflicts between nonnative and native fish species. Other programs would result in the same types of impacts discussed in Alternatives A and B. Increased sedimentation could affect aquatic habitat in the short term as a result of vegetation treatments and in the long term as a result of fire management. Watershed management could result in long-term improved habitat conditions in treated areas with an emphasis on recreation. Stream habitats in untreated areas would be jeopardized by increased risk of intense wildfires.

#### **Alternative D**

**Impacts from Fish and Wildlife Management Direction.** Under Alternative D, management direction would be to maintain, protect, and restore native fisheries. This would be accomplished by habitat improvements involving restoration of riparian areas. Habitat for nonnative fish species would not be actively managed. BLM also would encourage the Nevada Department of Wildlife to eliminate established nonnative fish populations and not develop any new nonnative fisheries. The primary method of eliminating nonnative fisheries would be to allow fishing harvests to continue for several years with no future stocking. If nonnative game fish populations are eliminated, recreational fishing would be terminated in the affected water bodies. The effects of reduced recreational fishing to local economies would be considered minor since reservoirs on state land have most of the fishing effort.

**Impacts from Other Programs.** Impacts to aquatic habitat and fish species associated with water resources, renewable energy, geology and mineral extraction, and noxious and invasive weed management activities would be the same as described for Alternative A. The effects associated with travel management and off-highway vehicle use and watershed management activities would be the same as described for Alternative B. The following interrelated programs would result in different impacts compared to Alternatives A and B.

*Vegetation.* Under Alternative D, vegetation treatment areas would be less extensive than other alternatives. This alternative also would result in the avoidance of in-channel manipulations. Therefore, Alternative D would involve less surface disturbance from treatments, and thus, would result in a lower potential erosion input to drainage during the short-term period. Herbicide use also would be constrained under this alternative.

*Wild Horses.* Within 24 herd management areas, horse populations would be uncontrolled, which would reduce vegetation and contribute erosion to drainages. Five streams (Huntington, Paris, Goshute, Cherry, and Egan creeks) in White Pine County and one stream (Upper Meadow Wash) in Lincoln County occur within several of these herd management areas. As a result, fish habitat could be degraded due to wild horse grazing and physical disturbance.

*Lands and Realty.* Since there would be no net loss of public lands under this alternative, fish species and their habitat would not be affected.

*Recreation.* Impacts to fish habitat could potentially occur under this alternative, as a result of increased dispersed recreation over a wider area that could include drainages.



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*Woodland and Native Plant Products.* Fish habitat would not be affected by this program, since there would be no fuelwood collection or other wood product harvests.

*Fire Management.* With minimal fire suppression occurring under Alternative D, it is expected that large areas would eventually burn as a result of natural ignitions. It also is expected that many of these fires would be large intense fires burning dense fuel accumulations, resulting in substantial erosion and sedimentation impacts to streams.

**Conclusion.** Habitat for nonnative fisheries would not be actively managed, which could involve the elimination of nonnative populations in some water bodies, and no new nonnative fisheries would be established. Greater impacts to nonnative fisheries habitat could occur due to uncontrolled wild horse population increases in herd management areas, increased dispersed recreation, and fire management with minimal fire suppression. Less short-term erosion would occur from vegetation treatment, but in the long term, erosion and sedimentation would be greater due to more intense fires.

### Alternative E

**Impacts from Fish and Wildlife Management Direction.** The effects to fish species and their habitat would be the same as described for Alternative B. In addition, the BLM would work with the Nevada Department of Wildlife and the U.S. Fish and Wildlife Service to enhance native fisheries wherever possible. Management direction also would attempt to balance native and nonnative fishery management strategies to identify, minimize, or eliminate conflicts between these two types of fisheries.

**Impacts from Other Programs.** The effects of management for most other programs on fisheries and aquatic habitat would be the same as described for Alternative B. Grazing management could result in different impacts, as discussed below.

*Livestock Grazing.* The effects of grazing on aquatic habitat would be reduced under this alternative, since emphasis would be on the protection of riparian areas. Corrective actions to livestock management would be implemented if grazing is a factor affecting riparian areas. On a short-term basis, erosion and riparian vegetation effects from grazing would continue until the affected areas become more stabilized through revegetation. In the long-term, habitat conditions in and near water bodies would improve due to the modification of grazing in sensitive areas.

**Conclusion.** Nonnative fisheries management would include habitat enhancement for native fish species where the two types of fisheries coexist. Vegetation treatments could result in increased short-term impacts from erosion and sedimentation immediately after treatment. These impacts would be minimized through implementation of best management practices during the treatment process. Changes in grazing management in riparian areas and restoration of vegetation resilience in nearby riparian and upland areas would improve habitat conditions over the long term.



## 4.6.2 Wildlife

### Impact Issues

The primary impact issues to wildlife as they relate to resource conflicts with other management programs on the Ely District include loss or alteration of native habitats, increased expansion of noxious weeds and other exotic weed species, decreased water availability, increased habitat fragmentation, changes in habitat and species composition, and direct loss of wildlife. Generally, anything that affects vegetation or watersheds also would affect wildlife habitat and, potentially, wildlife populations.

### Assumptions for Analysis

None.

### General impacts from Wildlife Treatments Tools and Techniques

Treatment tools for wildlife are summarized in Appendix E along with the tools used in conjunction with various other resource programs. The following paragraphs provide a general overview of the impacts anticipated from the use of major wildlife treatment tools. Standard operating procedures and best management practices that would reduce potential impacts to wildlife are presented in Appendices B, H, I, J, K, L, and N.

**Water escape ramps.** Escape ramps such as ladders or other devices would minimize potential impacts to small mammals and herptiles from becoming trapped in manmade water bodies (e.g., guzzlers).

**Elk crossing gates.** Elk gates and other similar devices would minimize potential impacts to big game species by allowing daily or seasonal (e.g., migration) movements of big game species across highways or other high traffic zones that would otherwise prohibit the movement of big game species or cause impacts to big game species or humans.

**Temporal Restrictions.** In many cases, temporal restrictions are used to restrict recreation, development, treatment, and other permitted activities during sensitive breeding and seasonal periods for wildlife. Temporal restrictions would minimize potential impacts to wildlife from direct disturbance of habitat and indirect effects from increased noise and human presence.

**Livestock fencing.** Livestock fencing is commonly used to control livestock distribution and to exclude livestock from important breeding or seasonal wildlife habitats (e.g., riparian zones, seasonal big game winter habitats). Wildlife would generally benefit from the exclusion of livestock by increasing available forage and water resources, improving breeding and seasonal habitats, and reducing habitat degradation.

**Prescribed fire and managed natural wildfire.** Prescribed fire and managed natural wildfire would be used along with other treatment methods (e.g., mechanical, chemical, and biological) to reduce heavy fuel loading and improve habitat to desired ranges of vegetation conditions. In the short term, localized fire



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prescriptions would generally benefit some wildlife species by increasing quantity and quality of herbaceous forage and ground cover. In the long term, various other species would be benefited by improved breeding and seasonal habitats. For example, elk would generally benefit soon after the vegetation treatments, while mule deer and sage grouse may not benefit until 20 to 30 years later.

**Water developments.** Water developments are generally used to increase the density and availability of water for wildlife and could be used to mitigate multiple-use impacts to game and nongame wildlife species from loss of habitat or reduction of natural waters. Although wildlife would generally benefit from water developments, it is expected that some species (e.g., elk and pronghorn) would benefit more than others and expand their distributions into previously unoccupied ranges. Potential wildlife conflicts from localized water developments would result in population expansion of some wildlife species, changes in species composition, and increased competition for available habitat resources (e.g., forage and cover).

**Telemetry.** Radio-telemetry is a common tool used to acquire detailed data on many aspects of wildlife biology including habitat use, home range size, mortality and survivorship, and migration timing and routes. Since many wildlife species are secretive and difficult to observe, radio-telemetry provides a valuable tool to learn more about a species' life-history. Because of the invasive nature of telemetry projects, impacts can occur if animals are unduly stressed or influenced by the capture technique, or if the behavior of the animal wearing the radio tag is not representative of normal behavior for the species.



### Interactions with Other Programs

The wildlife management program within the Ely District potentially would be affected by actions within the resource management programs for vegetation, wild horses, lands and realty, renewable energy, travel management and off-highway vehicle use, recreation, livestock grazing, woodland and native plant products, geology and mineral extraction, watershed management, fire management, and noxious and invasive weed management.

**Goal –** In cooperation with Nevada Department of Wildlife, provide habitat for wildlife (i.e., forage, water, cover, and space) that is of sufficient quality and quantity to support productive and diverse wildlife populations in a manner consistent with the principles of multiple-use management; to enhance biological diversity; and to sustain the ecological, economic, and social values necessary for all species.



### Alternative A

**Impacts from Fish and Wildlife Management Direction.** Management under this alternative would primarily address an immediate habitat need or habitat niche resulting from degraded and fragmented habitats on a species-specific and site-specific basis, and would focus primarily on the habitat needs of big game species. Potential wildlife conflicts would continue to result in long-term landscape level effects from increased habitat degradation and fragmentation, and a reduction in ecological health and vegetation resiliency.

Under this alternative, water developments would continue to be evaluated based on the Nevada Department of Wildlife water development criteria (see Section 2.5.6). Although wildlife would generally benefit from water developments, it is expected that some species (e.g., elk and pronghorn) would benefit more than others and expand their distributions into previously unoccupied ranges. Potential wildlife conflicts from localized water developments would result in population expansion of some wildlife species, changes in species composition, and increased competition for available habitat resources (e.g., forage and cover).

Under current management direction, migratory birds would continue to be managed in consideration of the BLM Best Management Practices (Appendix J) that were developed in response to Executive Order 13186. This BLM guidance provides measures that would reduce potential impacts to bird species resulting from management programs (e.g., grazing, recreation, and mineral and energy development). In addition, vegetation management would consider the biological needs of migratory bird species as they pertain to specific habitat communities (e.g., sagebrush, pinyon-juniper, riparian) in order to identify appropriate mosaics for the restoration and conservation of migratory bird habitat on a case-by-case basis. Habitat goals for migratory bird species would be consistent with the desired range of conditions for vegetation communities (see Section 2.5.5, Vegetation). Measures to protect breeding migratory birds would include blanket restrictions on surface disturbing activities and implementation of breeding bird surveys as outlined in Ely District policy. No long term management actions or projects to promote or restore habitat quality for migratory birds would be implemented under this alternative. As a result, potential wildlife conflicts would continue to result in long-term landscape level effects from habitat degradation and fragmentation, and a reduction in ecological health and vegetation resiliency.

Habitats would not be actively managed for the needs of nonnative upland game bird species (i.e., chukar, Hungarian partridge). Although restoration would promote more suitable habitat conditions for these and various other wildlife species on a localized basis, overall watershed level effects would continue to result in increased tree density and canopy cover, and a reduction in herbaceous ground cover.

This alternative would promote more suitable habitat conditions for various big game species. However, watershed level effects would continue to result in the reduction in available forage, cover, and overall suitability of shrubland habitats for wildlife species in the long term. On a landscape scale, shrubland habitats would continue to exhibit a reduction in overall habitat quality, ecological health, and vegetation resiliency in the long term.



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Restoration of seasonal habitats for Rocky Mountain bighorn sheep would occur on a fine scale (i.e., allotment, project, or portion of a watershed) and indirectly through wildfire emergency stabilization projects. As a result, landscape level effects to bighorn sheep habitat would continue to occur from habitat degradation and fragmentation effects associated with restrictive barriers that limit migration between seasonal habitats and other populations. However, habitat quality for this species would likely be improved through the gradual implementation of the Revised Guidelines for Management of Domestic Sheep and Goats in Native Wild Sheep Habitats (Instructional Memorandum No-98-140).

### Impacts from Other Programs.

*Vegetation.* Treatment and maintenance activities would occur primarily in pinyon-juniper and sagebrush communities although less extensive treatments would occur within each of the Great Basin vegetation types. Potential effects on wildlife from restoration activities (i.e., removal or thinning of woodland and shrubland) would result in the incremental long-term reduction of dense woody vegetation states to achieve desired range of conditions for vegetation communities (see Section 2.5.5, Vegetation). However, these impacts would have only minor impacts on wildlife species. In the short term (less than 5 years), localized restoration activities would benefit wildlife species by increasing quantity and quality of herbaceous forage and ground cover, and improve breeding and seasonal habitats for wildlife in the long term (greater than 50 years). However, the levels of treatment within various vegetation communities under this alternative are not expected to keep up with the ongoing decline of ecological health in these same communities. Vegetation communities would continue to exhibit ongoing habitat transitions (e.g., aspen to conifer and establishment of pinyon and juniper trees in sagebrush shrubland), increased tree density and canopy cover, and a reduction of native herbaceous understory (e.g., grasses and forbs) in untreated areas. Thus, although localized restoration activities to achieve the desired range of conditions would generally improve habitats for wildlife in localized areas, landscape level effects would continue to result in a reduction in ecosystem health and ecological resiliency, and an overall reduction in habitat quality in the long term.

Management of the Mojave Desert ecological system would focus on maintaining or improving vegetation health and resiliency through management of various uses (e.g., livestock grazing, recreation, and wild horse herds) and the localized treatment of noxious weeds and exotic woody species (e.g., red brome and tamarisk). Although localized restoration activities would benefit wildlife species by increasing herbaceous forage and ground cover in the short term (less than 5 years), and improving vegetation composition and structure in the long term (greater than 50 years), the levels of treatment under this alternative are not expected to keep up with the ongoing spread of invasive species. Thus, landscape level effects would continue to result in increased habitat degradation and a reduction in overall habitat quality in the long term.

*Wild Horses.* Wild horses would be managed within 24 herd management areas covering approximately 5.36 million acres of habitat. Impacts of wild horses on wildlife would result in long-term impacts from resource competition (e.g., water and forage) within herd management areas. Competition would occur primarily during periods of sustained drought and effects would be most evident in areas where herd management areas conflict with crucial/key big game ranges and migration corridors (elk, mule deer, pronghorn, and Rocky Mountain bighorn sheep). **Table 4.6-1** presents acres of crucial big game ranges and migration corridors that would be affected by wild horses under this alternative. **Table 4.6-1** also presents



acres of unoccupied habitat for Rocky Mountain bighorn sheep that would be affected by wild horse management. No occupied Rocky Mountain bighorn sheep habitat would be affected by wild horse management.

**Table 4.6-1**  
**Approximate Acres of Crucial/Key Habitats and Migration Corridors**  
**Affected by Wild Horse Management**

Elk (acres)		Mule Deer (acres)		Pronghorn (acres)		Rocky Mountain Bighorn Sheep (acres)
Crucial Habitat	Migration Corridor	Crucial Habitat	Migration Corridor	Crucial Habitat	Migration Corridor	Unoccupied Habitat
138,000	94,000	943,000	1,300,000	21,000	237,000	549,000

*Lands and Realty.* Potential disposal of lands would occur outside of designated big game and upland game habitats. Possible land disposals would be evaluated for effects on wildlife and its habitat on a case-by-case basis, in accordance with NEPA.

Linear and communication projects that would be co-located with existing facilities would continue to result in increased habitat degradation and fragmentation in the long term. Development of newly proposed utility projects and communication sites would be evaluated for effects on wildlife and its habitat, on a case-by-case basis, in accordance with NEPA. Requirements that would reduce potential impacts to wildlife are presented in Appendix N.

Wildlife conflicts with land use authorization would be expected to result in the long-term reduction of wildlife habitat and increased effects from habitat fragmentation. Short-term impacts would result from increased noise and human presence. Under this alternative, wildlife would benefit from the avoidance of land use authorization within portions of ACECs (see Section 2.5.12, Lands and Realty). Development of new land use authorization facilities would be evaluated for effects on wildlife and its habitat on a case-by-case basis, in accordance with NEPA.

*Renewable Energy.* Conflicts from renewable energy development would likely have localized effects to game and nongame species and their habitats. Long-term impacts would result from habitat loss and increased habitat fragmentation until reclamation is completed and native vegetation has become reestablished. Short-term impacts would result from increased noise and human presence. These effects are anticipated to occur incrementally over time and at scattered locations over a large geographic area within the Ely District. Potential impacts would include limited mortalities of smaller, less mobile species of wildlife, such as small mammals and reptiles, and the displacement of more mobile species into adjacent habitats. Displacement also could result in some local reductions in wildlife populations if adjacent habitats are at carrying capacity. In areas where potential development intersects or approaches important wildlife habitat (e.g., seasonal ranges and breeding areas) and important flyways for migrating birds, resulting effects may require specific mitigation measures to minimize potential impacts. On a landscape scale, potential wildlife conflicts would result in long-term effects from increased habitat degradation and



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fragmentation. Development of renewable energy would be evaluated for effects on wildlife and its habitat on a case-by-case basis, in accordance with NEPA. Best management practices that would reduce potential impacts to wildlife are presented in Appendix B.

*Travel Management and Off-highway Vehicle Use and Recreation.* Development of roads and trails within the District would be expected to result in the incremental long-term loss of habitat and increased habitat fragmentation. Short-term impacts to wildlife would result from increased noise and human presence. The greatest effects from these management programs would occur from activities that intersect or approach important wildlife habitats (e.g., key seasonal ranges and breeding areas). On a landscape scale, potential wildlife conflicts would result in increased habitat degradation and fragmentation. Development of new roads and trails within the District would be evaluated for effects on wildlife and its habitat on a case-by-case basis, in accordance with NEPA. Standard operating procedures and best management practices that would reduce potential impacts to wildlife are presented in Appendices H, I, J, and K.

*Livestock Grazing.* Wildlife conflicts with livestock grazing would include continued competition where it presently occurs for forage, cover, and water resources throughout the District. Where competition results in excessive use, localized changes in plant community composition and wildlife population numbers may result, particularly in key big game habitats. Under this alternative, livestock utilization levels and special use restriction would continue to be implemented through existing framework plans and site-specific activity plans. These utilization levels may limit the availability of key shrubs, forbs, and grasses for wildlife use within some big game habitats (e.g., elk, pronghorn, and mule deer). Current range and livestock management also would continue to limit the availability of herbaceous cover for game birds and other wildlife species in the long term.

Competition between Rocky Mountain bighorn sheep and livestock within occupied ranges (approximately 12,000 acres) and potential competition in historic ranges (approximately 945,000 acres) would continue to limit the expansion of the bighorn populations. On a landscape level, effects to bighorn sheep would continue to result from long-term effects of habitat degradation and added fragmentation effects from restrictive barriers that limit migration between seasonal habitats and other populations. However, up to approximately 454,000 acres of Rocky Mountain bighorn sheep habitats would likely be improved through the Revised Guidelines for Management of Domestic Sheep and Goats in Native Wild Sheep Habitats (Instructional Memorandum No-98-140), if implemented.

*Woodland and Native Plant Products.* Management of woodland and native plant products uses would result in only minor effects from the incremental long-term loss of pinyon-juniper trees and mountain mahogany and short-term seasonal effects from increased noise and human presence. These effects would be most apparent within key wildlife habitats. Implementation of standard operating procedures and best management practices would reduce potential impacts to wildlife.

*Mineral Extraction.* Mineral development activities likely would have localized effects on game and nongame species and their habitats. Under Alternative A, long-term impacts to wildlife would result from the disturbance of approximately 15,600 acres of potential habitat and the added effects from habitat



fragmentation in association with oil and gas, geothermal, and metallic and industrial minerals development. Short-term impacts would result from increased noise and human presence. These effects are anticipated to occur incrementally over time and at scattered locations a large geographic area within the Ely District. Potential impacts would include limited mortalities of smaller, less mobile species of wildlife (e.g., small mammals and reptiles) and the displacement of more mobile species into adjacent habitats. Displacement also could result in some local reductions in wildlife populations if adjacent habitats are at carrying capacity. In areas where potential development intersects or approaches important wildlife habitat (e.g., key/crucial seasonal ranges and breeding areas), specific mitigation measures may be required to minimize potential impacts. Proposed mineral development projects would be evaluated for effects on wildlife and its habitat on a case-by-case basis, in accordance with NEPA. Terms and conditions that would reduce potential impacts to wildlife and their habitats are presented in Appendix L.

*Watershed Management.* Following vegetation treatments, the quantity and quality of forage (i.e., herbaceous vegetation) is expected to increase within treated areas and would provide improved habitat for wildlife in the short term. In the Schell Resource area, the reservation of 30 percent of additional forage for wildlife would continue to provide an incremental increase in available forage for wildlife species. Additional forage within the Egan and Caliente Resource Areas on the District would continue to be allocated or reserved proportionately among all users, including wildlife, on a case-by-case basis. Although treated areas would provide additional herbaceous forage and increased habitat quality for wildlife in the short term, landscape level effects would continue to result from habitat degradation and fragmentation, reduction in ecological health, and reduction in vegetation resiliency in the long term.

*Fire Management.* Restoration activities resulting from fire use and prescribed fire would commonly improve forage palatability for numerous wildlife species through the use of both native and nonnative plant species, increase the availability of herbaceous forage plants, and increase the amount of habitat edge for wildlife in the short term. However, at the historic rate of restoration (approximately 10,000 acres per year), it is anticipated that vegetation communities would continue to exhibit habitat transitions (e.g., aspen to conifer and establishment of pinyon and juniper trees in sagebrush shrubland), increased tree density and canopy cover, and a reduction of native herbaceous understory (e.g., grasses and forbs) in untreated areas. In the absence of large fires, these habitat changes would result in a reduction of herbaceous forage, structure, and overall suitability of habitats for wildlife. Even with the expansion of fire use to the extent allowed under the current fire plan, it is expected that woody fuels would continue to accumulate in untreated areas, and the probability of major, uncontrollable stand replacing fires will continue to escalate. Thus, over the long term, it is anticipated that increased large fire events would provide open niches for expansion of nonnative and weedy species including flammable annuals and non-palatable perennials. On a landscape scale, habitats would exhibit a reduction in overall habitat quality, ecological health, and vegetation resiliency in the long term.

*Noxious and Invasive Weed Management.* Management of noxious weeds may cause some temporary and localized impacts to game and nongame species as a result of noxious weed eradication techniques (i.e., use of herbicide) within the District. Impacts to wildlife species would not be expected to cause population level effects. Standard operating procedures developed to reduce potential impacts with wildlife are presented in Appendix H. Treatments designed to decrease or eliminate noxious weeds would benefit



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wildlife habitats in the long term by reducing or eliminating the chances for dominance of plant species with limited forage or cover values.

**Conclusion.** Although restoration would promote more suitable habitat conditions for wildlife species on a localized basis, long-term watershed level effects would continue to result in the conversion of vegetation cover types, increased tree density and canopy cover, decreased forest and shrub community structure, and a reduction in herbaceous cover for wildlife species. Landscape level effects would continue to result in increased habitat degradation and fragmentation, and a reduction in ecological health and vegetation resiliency.

##### Alternative B

**Impacts from Fish and Wildlife Management Direction.** Under Alternative B, wildlife habitat management would emphasize active and passive restoration for both game and nongame species where no known conflicts with native species exist. On a watershed basis, implementation of restoration activities and habitat management would increase available forage and cover, structure, and breeding and seasonal wildlife habitats in the long term. On a landscape level, restoration and habitat management to achieve a desired range of vegetation conditions would benefit wildlife by reducing habitat degradation and fragmentation, promoting ecological health, and improving vegetation resiliency. With the higher rates of vegetation treatments in this alternative, there would be greater temporary displacement of wildlife than in Alternative A. This, in turn, would contribute to greater indirect or secondary impacts to other resources and uses such as vegetation, wild horses, livestock grazing, and watersheds.

Implementation of this alternative would increase water availability and improve habitat quality for both game and nongame species within the District. In addition, increased riparian community health and resiliency would benefit both riparian dependent species and upland species in the long term by implementing riparian restoration actions and livestock management techniques in riparian areas. However, potential wildlife conflicts would continue to result in population expansion of some wildlife species (e.g., elk and pronghorn), changes in species composition, and increased competition for available habitat resources during the short term while watershed analyses are being conducted and treatment plans are being implemented.

Under this alternative, implementation of restoration activities and habitat management would result in the long-term reduction of habitat for pinyon-juniper-dependent migratory bird species and a short-term reduction of habitat for sagebrush-dependent migratory bird species. However, implementation of this alternative would increase available forage and cover, and improve nesting and seasonal habitats for sagebrush-dependent migratory birds and other wildlife species on a long-term basis. As a result, population numbers of sagebrush-dependent species would improve under this alternative in the long term. On a landscape scale, maintenance and conservation of migratory bird habitats would further benefit wildlife by increasing habitat quality within designated migratory bird areas and migration corridors.



Habitat management for nonnative upland game bird species (i.e., chukar, Hungarian partridge) would be the same as Alternative A, but they would generally benefit from the increased focus on wildlife habitat restoration in this alternative as compared to Alternative A.

On a watershed basis, implementation of restoration activities and management actions in Alternative B would promote increased shrub, browse, and forb forage production; increased escape and thermal cover; improved breeding and seasonal habitats for wildlife including mule deer and pronghorn; and a reduction in population growth of elk on the District in the long term. In areas where no conflicts would occur with shrubland habitat management objectives, elk habitat would be actively managed to achieve a predominant early-mid phase of the herbaceous state which would provide increased forage for elk. On a landscape level, restoration and habitat management to achieve desired ranges of vegetation conditions would benefit wildlife within the Great Basin ecological system by reducing habitat degradation and fragmentation, and promoting ecological health and vegetation resiliency.

Implementation of restoration and management actions would promote increased shrub, browse, and forb forage production; improved escape and thermal cover; and improved breeding and seasonal habitats. In addition, removal of conflicting uses (i.e., livestock grazing) in all Rocky Mountain bighorn sheep ranges and migration corridors would improve overall habitat quality and expand the distribution of Rocky Mountain bighorn sheep on the District.

**Impacts from Other Programs.** Effects to wildlife associated with invasive and nonnative plant species would be the same as described for Alternative A. The following interrelated programs would result in different effects as compared to Alternative A.

*Vegetation.* Alternative B would involve a substantially greater level of vegetation treatment and a different desired range of conditions than Alternative A. Although treatment and maintenance activities would occur over a broader spectrum of vegetation communities than under Alternative A, treatment and maintenance activities would continue to focus on pinyon-juniper and sagebrush communities on an acreage basis, particularly within high priority watersheds. Additional types emphasized for treatment, but involving less acreage, are aspen and riparian communities. Limited areas of treatment also would occur in other vegetation communities where current conditions are not within the desired range of conditions.

Impacts to wildlife from vegetation management under Alternative B would include the long-term reduction of woody vegetation and the temporary reduction of forage and cover in the areas being treated until the desirable perennial species recover or become reestablished. It is anticipated that treated areas would result in increased herbaceous forage and ground cover in the short term (less than 5 years), followed by the establishment of shrub vegetation in the long term (greater than 50 years) that meet the desired range of conditions for vegetation communities as described in Section 2.5.5, Vegetation. On a watershed level, restoration activities would result in higher quality forage, increased vegetation cover, improved community structure, and improved breeding and seasonal habitats for wildlife species. On a landscape level, restoration and habitat management would benefit wildlife by reducing habitat degradation and fragmentation, and promoting ecological health and vegetation resiliency, and improving overall habitat quality.



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*Wild Horses.* Wild horse management would have the same general effects on wildlife as described under Alternative A except that wildlife conflicts with wild horses would be reduced as a result of a reduction of herd management areas (by approximately 1.76 million acres) and a reduction in overall herd sizes on the District. Under this alternative, wildlife would benefit from the exclusion of wild horses by increasing herbaceous forage and water availability in the short term, followed by an increase in overall habitat quality in the long term, particularly within the Mojave Desert ecological system. **Table 4.6-2** presents acres of crucial big game ranges and migration corridors that would be affected by wild horse management under this alternative. **Table 4.6-2** also presents acres of unoccupied habitat for Rocky Mountain bighorn sheep that would be affected by wild horse management. No occupied Rocky Mountain bighorn sheep habitat would be affected by wild horse management. Under this alternative, in comparison with Alternative A, there would be less competition for resources (e.g., water and forage) where herd management areas conflict with crucial/key big game ranges (by approximately 389,000 acres) and migration corridors (by approximately 331,000 acres) for elk, mule deer, and pronghorn. There also would be less competition for resources where herd management areas conflict with unoccupied Rocky Mountain bighorn sheep habitat by approximately 33,000 acres.

**Table 4.6-2**  
**Approximate Acres of Crucial/Key Habitats and Migration Corridors**  
**Affected by Wild Horse Management**

Elk (acres)		Mule Deer (acres)		Pronghorn (acres)		Rocky Mountain Bighorn Sheep (acres)
Crucial Habitat	Migration Corridor	Crucial Habitat	Migration Corridor	Crucial Habitat	Migration Corridor	Unoccupied Habitat
136,000	65,000	558,000	1,030,000	19,000	205,000	516,000

*Lands and Realty.* Potential land disposals would be evaluated for effects on wildlife and its habitat on a case-by-case basis, in accordance with NEPA.

Specific types of linear projects would be required to co-locate within designated corridors, and new communication sites only would be developed after existing sites have reached capacity. Under this alternative, new 0.5-mile-wide utility corridors would be designated within the District. Potential effects to wildlife would include the incremental long-term disturbance of wildlife habitat and added effects from habitat fragmentation. Short-term impacts would result from increased noise and human presence. These effects are anticipated to occur incrementally over time and at scattered locations over a large geographic area within the Ely District. Potential impacts would include limited mortalities of smaller, less mobile species of wildlife (e.g., small mammals and reptiles) and the displacement of more mobile species into adjacent habitats. Displacement also could result in some local reductions in wildlife populations if adjacent habitats are at carrying capacity. In areas where potential development intersects or approaches important wildlife habitat (e.g., key/crucial seasonal ranges and breeding areas), resulting effects may require specific mitigation measures in order to minimize potential impacts. Requirements that have been developed to reduce potential impacts to wildlife and their habitats from utility corridors are presented in Appendix N.



Development of utility projects and communication sites would be evaluated for effects on wildlife and its habitat, and mitigated as needed, on a case-by-case basis, in accordance with NEPA.

Implementation of Alternative B would result in fewer wildlife conflicts from land use authorizations as compared to Alternative A. Land use authorization facilities would be located and consolidated within or adjacent to existing land use authorizations, where feasible, thus minimizing overall effects to wildlife. Development of new land use authorization facilities would be evaluated for effects on wildlife and its habitat on a case-by-case basis, in accordance with NEPA.

*Renewable Energy.* Conflicts with wildlife and habitats would be the same as discussed for Alternative A except that approximately 201,000 acres of habitat would be designated for potential wind energy and approximately 6.8 million acres of habitat would be designated as potential solar energy development areas. Renewable energy development would not necessarily be restricted to these areas.

*Travel Management and Off-highway Vehicle Use and Recreation.* Travel management and off-highway vehicle use and recreation management activities would have the same general effects on wildlife as described under Alternative A, except no cross-country off-highway vehicle use would be permitted, and use within most of the District would be restricted to existing roads and trails. The management actions of this alternative would concentrate habitat degradation and habitat fragmentation, and would increase noise levels and human presence in a smaller area than Alternative A. Development of new roads and trails within the District would be evaluated for effects on wildlife and its habitat on a case-by-case basis, in accordance with NEPA. Implementation of standard operating procedures and best management practices that would reduce potential impacts to wildlife are present in Appendices H, I, J, and K.

*Livestock Grazing.* Effects to wildlife from livestock grazing would be similar to those described for Alternative A except that there would be approximately 3.6 million fewer acres throughout the District that would be available for livestock grazing with closure of desert tortoise habitat, bighorn sheep habitat, and some additional ACECs. Implementation of this alternative would be expected to incrementally increase herbaceous forage and water availability for wildlife in the short term, followed by the incremental increase in breeding and seasonal habitats (e.g., ground cover and vegetation structure) for Mojave Desert wildlife in the long term. Under this alternative, big game habitat assessments would be performed in crucial mule deer and pronghorn sheep habitats as part of the watershed analysis process, with the objective of identifying if livestock are a causal factor for nonattainment of standards. If livestock are determined to be the causal factors for nonattainment of the standards and guidelines, corrective actions to livestock management would occur. Under this alternative, wildlife would benefit in the short-term from forage and additional forage bases that are created through maintenance and restoration of habitats on a watershed level.

Under this alternative, domestic livestock (sheep and cattle) would be eliminated in approximately 3,038,100 acres of occupied and historic Rocky Mountain and desert bighorn sheep ranges. As a result, conflicts between bighorn sheep and livestock within occupied and historic ranges would be greatly reduced and increased herbaceous forage and water availability would result in the short term (less than 5 years).



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These changes would result in improved habitat quality, expansion of bighorn populations into unoccupied ranges, and improved overall health of bighorn sheep populations in the long term.

*Mineral Extraction.* Effects from geology and mineral development on wildlife would be similar to those discussed for Alternative A, except that potential short-term impacts to Rocky Mountain bighorn sheep during the breeding and lambing season would be minimized based on programmatic wildlife stipulations developed for bighorn sheep.

*Watershed Management.* After Standards for Rangeland Health have been met at the watershed level, additional forage would be reserved for wildlife. Implementation of this alternative would provide a net increase in available forage for wildlife species in the long term.

*Fire Management.* The expanded use of fire under this alternative would facilitate treatment and restoration over greater areas as compared to Alternative A. In the short term, it is anticipated that treatment areas would result in increased herbaceous forage and ground cover for wildlife species, followed by improved shrubland habitat conditions (e.g., community structure) in the long term. On a landscape level, restoration and habitat management would benefit wildlife by improving ecological health, vegetation resiliency, and overall habitat quality. Return to historical fire regimes and condition classes would reduce the impacts to fish and wildlife when fires occur.

**Conclusion.** On a watershed level, restoration activities would result in increased herbaceous forage, increased cover and community structure, and increased habitat quality for wildlife species. On a landscape level, restoration activities would improve wildlife habitats by reducing habitat degradation and fragmentation, promoting ecological health, and improving vegetation resiliency. Increased areas of treatment and widespread use of prescribed fires and managed natural fires would reduce the more severe impact of wildfires.

### Alternative C

**Impacts from Fish and Wildlife Management Direction.** Activities in Alternative C would emphasize increased elk populations and expansion of their distribution on the District. Potential wildlife conflicts would include landscape level effects from a reduction of shrubland and woodland habitats, habitat degradation and fragmentation, and, in untreated areas, a continued reduction in ecological health and vegetation resiliency. Improvement in vegetation resiliency and watershed conditions in treated areas would be beneficial to numerous wildlife species, although a few other species may be adversely affected by these changes.

Wildlife conflicts from localized water developments would be similar to those identified for Alternative A, except that the severity of impacts on wildlife would be greater under this alternative, resulting in increased population expansion of some wildlife species (e.g., elk) and increased competition for habitat resources (e.g., forage and cover).

Habitat management for and expected effects on migratory birds would be the same as Alternative A.



Habitat management under this alternative would favor species such as nonnative game birds. Potential wildlife conflicts would result in increased competition for resources (e.g., forage, cover, water) between native and nonnative species.

Under this alternative, big game habitats would be managed in concert with commodity production objectives to create a predominantly early phase of the herbaceous state across the landscape which would benefit various wildlife species such as elk. On a watershed basis, implementation of restoration activities and management actions would result in the reduction of shrub and browse forage, decreased escape and thermal cover, and a reduction in breeding and seasonal habitats for shrub-dependent wildlife including mule deer. In areas where no conflicts would occur with livestock or commodity oriented objectives, mule deer and pronghorn habitat would be actively managed. On a landscape scale, these changes would result in continued reduction in habitat quality for some wildlife species associated with dense sagebrush stands, while improving ecological health, vegetation resiliency, and habitat quality for other wildlife species on treated areas in the long term.

Implementation of restoration and management actions would promote increased shrub, browse, and forb production; escape and thermal cover; and improved breeding and seasonal habitats for Rocky Mountain bighorn sheep within the desired range of conditions where no livestock or commodity conflicts occur. Overall habitat quality for this species also would be improved through the Revised Guidelines for Management of Domestic Sheep and Goats in Native Wild Sheep Habitats (Instructional Memorandum No-98-140), if implemented.

**Impacts from Other Programs.** Effects to wildlife associated with livestock grazing, woodland and native plant products, and invasive and nonnative plant species would be the same as or similar to those described for Alternative A. Effects associated with wild horses, renewable energy, and mineral extraction would be similar to those described for Alternative B. The following interrelated programs would result in different effects as compared to the previous alternatives.

*Vegetation.* Vegetation treatments in Alternative C would focus on somewhat greater total acreage to be treated than under Alternative B, but the goals of treatment and management would focus treatments on the creation of vegetation communities that are more productive for commodity interests such as livestock and elk forage. Under this alternative, restoration treatments would maximize herbaceous vegetation states and limit the amount of mature woodland and shrub states, as compared to other alternatives. Thus, achievement of successful restoration would generally benefit a somewhat different set of wildlife species under this alternative than under Alternative B. Like Alternative B, treatments would occur across all vegetation types, but the greatest area of treatments would occur in sagebrush and pinyon-juniper communities with limited applications in other communities where current conditions are not within the desired ranges of vegetation conditions.

Impacts to wildlife from the vegetation management under Alternative C would include the short-term reduction in forage and ground cover on each treatment area until the desirable perennial species recover or become established, and the long-term conversion from dense shrub and woodland communities to



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open, herbaceous-dominated communities on much of the area to be treated. While this conversion would favor some wildlife species (e.g., elk and grassland birds) by creating a greater amount of herbaceous forage, a reduction of more mature and dense shrub vegetation would result in the long-term reduction of breeding and seasonal habitats for shrubland-dependent species. On a landscape scale, habitats would exhibit a reduction in overall habitat quality for numerous wildlife species in the long term.

*Lands and Realty.* Wildlife conflicts from possible disposal of lands would be the same as described for Alternative B except that a substantially greater area would be available for possible disposal. Wildlife conflicts with utility corridor management would result in the same general effects to wildlife as described under Alternative B, except that existing designated corridors would be increased to 3 miles in width, potentially resulting in greater fragmentation effects. Potential wildlife conflicts with the development of communications sites would be the same as described for Alternative B.

Land use authorization facilities would likely result in increased habitat degradation and fragmentation effects on wildlife habitats in the long term. Development of new land use authorization facilities would be evaluated for effects on wildlife, in accordance with NEPA. Implementation of requirements that would reduce potential impacts to wildlife are present in Appendix N.

*Travel Management and Off-highway Vehicle Use and Recreation.* Conflicts from travel management and off-highway vehicle use and recreation would be similar to Alternative B, except that larger areas would be established for special recreation management areas and off-highway vehicle emphasis areas. As a result, degradation of habitat and habitat fragmentation associated with these uses would occur on a larger area than under Alternative B but in a more concentrated area than under Alternative A.

*Watershed Management.* After Standards for Rangeland Health have been met at the watershed level, additional forage would be allocated to livestock rather than being reserved for wildlife species.

*Fire Management.* Under Alternative C, prescribed fire and managed natural fire would not be the preferred management tools and wildland fires would be suppressed to the extent practical. Although areas treated may be greater than described for Alternative A, it is anticipated that increased fuel loading from full fire suppression on the District would eventually lead to large fire events in untreated areas that would lead to greater long-term habitat effects to wildlife species than discussed for either Alternative A or Alternative B.

**Conclusion.** Implementation of this alternative would favor increased populations and expansion of high commodity wildlife species (e.g., elk). On a watershed level, wildlife conflicts would include decreased shrub cover, reduced community structure, and increased competition for habitat by sagebrush-dependent species. Landscape level effects would result in improved ecological health and vegetation resiliency despite a reduction in shrub and woodland-dominated areas. Increased potential for major widespread fires also would affect wildlife habitat over the long term.



### Alternative D

**Impacts from Fish and Wildlife Management Direction.** Implementation of this alternative would result in the continuation of habitat conversion (e.g., aspen to conifer, and establishment of pinyon and juniper trees in sagebrush shrubland), increased tree density and canopy cover, and a reduction of native herbaceous understory (e.g., grasses and forbs). The increased woody fuel and woody competition with herbaceous vegetation would cause some untreated plant communities to cross ecological thresholds. Eventually, these untreated communities would burn, resulting in hotter fires that would cause soil to be more susceptible to accelerated erosion and expansion of weeds. These habitat changes would result in a reduction of herbaceous forage, community structure, and overall suitability of habitats for wildlife species. Increased displacement of big game by fires would affect vegetation and wild horses in adjacent areas. On a landscape scale, these changes would result in continued reduction in overall habitat quality, ecological health, and vegetation resiliency.

Under this alternative, wildlife would benefit from the increased availability of natural surface water from exclusion of discretionary commodity uses of public lands (e.g., livestock grazing). As a result, potential conflicts to wildlife from water developments would be minor. However, some artificial water developments for livestock would cease to provide water for wildlife as they are abandoned or removed.

Implementation of this alternative would result in the continuation of habitat conversion (e.g., aspen to conifer, and establishment of pinyon and juniper trees in sagebrush shrubland), increased tree density and canopy cover, and a reduction of native herbaceous understory (e.g., grasses and forbs). Although localized restoration activities would improve habitat conditions for wildlife species, landscape level changes would continue to result in habitat degradation, reduction in ecological health and resiliency, and reduction in overall biological diversity, largely as a result of increasing numbers of large-scale fires and spread of invasive species.

Habitats would not be actively managed for the needs of nonnative upland game species (i.e., chukar, Hungarian partridge) and the Nevada Department of Wildlife would be encouraged to eliminate established nonnative game bird populations and to not establish any new nonnative game birds. Implementation of this alternative would reduce potential resource competition between native and nonnative species on the District.

Big game within the Great Basin ecological system (elk, mule deer, pronghorn) would benefit from the exclusion of discretionary uses (e.g., livestock grazing) of public lands. Natural processes would be allowed to function and dictate the mosaics of wildlife habitats on a landscape scale. Under this alternative, habitats for big game species would not be actively managed to increase species distribution or densities beyond what natural habitats and water sources would support. Active restoration would only occur where human-induced alterations have modified the natural environment. Following the exclusion of discretionary uses of public lands, all available forage would be made available for watershed maintenance, wildlife, and wild horses. However, as discussed above, because this alternative would emphasize passive restoration with limited active habitat management, implementation of this alternative would result in the continuation of habitat conversion (e.g., aspen to conifer, establishment of pinyon and juniper trees in sagebrush



## 4.0 ENVIRONMENTAL CONSEQUENCES

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shrubland), increased tree density and canopy cover, and a reduction of native herbaceous understory (e.g., grasses and forbs). Although localized restoration activities would improve habitat conditions for wildlife species, landscape level changes would continue to result in habitat degradation, reduction in ecological health and resiliency, and reduction in overall biological diversity largely as a result of increasing numbers of large-scale fires and spread of invasive species.

Management of historic Rocky Mountain bighorn sheep habitats would have the same general effects as discussed above for big game, except that active habitat restoration would be emphasized only in areas affected by wildfires or where invasive species dominate.

**Impacts from Other Programs.** Under this alternative, effects to wildlife associated with mineral extraction and invasive and nonnative plant species would be the same as described for Alternative A. The following interrelated programs would result in different effects as compared to the previous alternatives.

*Vegetation.* Management of vegetation would emphasize a passive management approach to restoration with minimal influence from management and resource uses. As a result, degraded and fragmented habitats would be left to recover through natural processes. As discussed in Section 4.5, if such recovery occurs at all, it is expected to be very slow in this environment. Active habitat management would emphasize habitat treatments of invasive vegetation species. Implementation of this alternative would result in the continuation of ongoing habitat transitions (e.g., aspen to conifer and establishment of pinyon and juniper trees in sagebrush shrubland), increased tree density and canopy cover, and a reduction of native herbaceous understory (e.g., grasses and forbs) in the long term. In the absence of large fires, these habitat changes would result in a reduction of herbaceous forage, community structure, and overall suitability of habitats for wildlife in the long term. However, with the accumulation of fine fuels in sagebrush (due to reduced large herbivore grazing) and heavy fuels in dense shrub and tree communities, increased large fire events would remove large areas of woodland and shrubland. Within the dense, overmature stands of sagebrush or pinyon-juniper woodlands, perennial understory species of grasses and forbs are commonly absent. Thus, without costly rehabilitation measures, most of these burned areas would not recover with native perennial herbaceous vegetation. Rather, the freshly burned areas would provide open niches for expansion of nonnative and weedy species including flammable annuals and non-palatable perennials. On a landscape scale, habitats would exhibit a reduction in overall habitat quality, ecological health, and vegetation resiliency in the long term.

*Wild Horses.* Under this alternative, conflicts with wildlife would be incurred in the same 24 herd management areas discussed for Alternative A, but wild horse populations within these areas would be uncontrolled, substantially increasing the impacts to wildlife. It is expected that these uncontrolled populations would destroy the herbaceous forage and ground cover, reduce habitat structure, and diminish overall habitat quality in the long term.

*Renewable Energy.* Because there would be no new land use authorizations under Alternative D, there would be no impacts to wildlife.



*Lands and Realty.* Effects to wildlife and habitats resulting from lands and realty actions would be minimal since no net loss of habitat would occur under this alternative, nor would there be any new land use authorizations such as the designation of new rights-of-way.

*Travel Management and Off-highway Vehicle Use and Recreation.* Conflicts with travel management and off-highway vehicle use and recreation would be substantially reduced in this alternative with off-highway vehicle use being restricted to designated roads and trails on approximately 400,000 acres. This would greatly reduce the effects to wildlife by reducing overall habitat degradation and fragmentation as compared to the other alternatives.

*Livestock Grazing.* No conflicts with livestock management would occur under this alternative since livestock use would not be permitted on the District. This aspect of Alternative D would result in higher habitat quality for wildlife, at least in the short term.

*Woodland and Native Plant Products.* Effects to wildlife and habitats resulting from woodland and native plant products would be minimal since only pinyon pine nut harvesting would be permitted.

*Watershed Management.* Additional available forage would be reserved for watershed maintenance and wildlife and allocated to wild horses after Standards for Rangeland Health have been met at the watershed level. However, because active management would not be a priority under this alternative, watershed level impacts would continue to result in habitat conversion (e.g., aspen to conifer, and establishment of pinyon and juniper trees in sagebrush shrubland), increased canopy cover, and a reduction of native herbaceous understory (e.g., grasses and forbs). Landscape level impacts would continue to result in a reduction in overall habitat quality, ecosystem health, ecological resiliency, and species diversity.

*Fire Management.* Implementation of this alternative with minimal fire suppression and limited vegetation treatments would result in fire events that would have a high likelihood of causing major impacts to shrub cover and woodland habitats for game and nongame wildlife in the long term. These impacts would be expected to occur at a large geographic scale with substantial cover losses, especially at lower elevations. Depending on shrub and woodland overstory, recovery rates, fire frequency, and reclamation success, these events could result in short- and long-term impacts. Effects would include diminished habitat productivity and diversity for entire communities of shrubland and woodland wildlife. In the event of unsuccessful fire rehabilitation, these areas could devolve into vast monocultures of herbaceous grasslands dominated by cheatgrass and other invasive species that are of little or no value to wildlife.

**Conclusion.** The passive management approach of this alternative coupled with minimal fire suppression would result in continued degradation of wildlife habitat with increased tree density and canopy cover and a reduction of native herbaceous understory species. These habitat changes would result in reductions of herbaceous forage, plant community structure and complexity, and overall habitat suitability for wildlife species. Increased potential for major widespread fires also would affect wildlife habitat over the long term.



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### Alternative E

**Impacts from Fish and Wildlife Management Direction.** Effects to wildlife habitat generally would be the same as described for Alternative B. Impacts to wildlife would generally be similar and closely related to impacts to vegetation, watersheds, and livestock.

Increased riparian community health and resiliency would benefit both riparian dependent species and upland species in the long term by implementing riparian restoration actions and livestock management techniques in riparian areas. However, potential wildlife conflicts would continue to result in population expansion of some wildlife species (e.g., elk and pronghorn), changes in species composition, and increased competition for available habitat resources (e.g., forage and cover) during the short term.

Management of migratory birds and their habitats would have the same effects as described for Alternative B.

Habitats for nonnative game birds (i.e., chukar, Hungarian partridge) would be managed indirectly through restoration of natural systems that have been affected by various disturbance factors (e.g., poor grazing management, fires, and weeds) where no known conflicts with native species exist. Implementation of this alternative would increase available forage, hiding cover, and nesting habitat for nonnative game bird species in the long term.

Big game (e.g., elk, mule deer, pronghorn) habitats within the Great Basin ecological system would be managed to meet the public demand for increased game species distribution, densities, and increased recreational opportunity, beyond what natural habitats and water sources would support, but in balance with other wildlife habitat objectives.

On a watershed basis, implementation of restoration activities and management actions would promote increased shrub, browse, and forb forage production; increased escape and thermal cover; reduce habitat competition, improved breeding and seasonal habitats for wildlife including mule deer and pronghorn, and a reduction in population growth of elk on the District in the long-term. On a landscape level, restoration and habitat management to achieve desired ranges of vegetation conditions would benefit wildlife within the

#### *RMP Management Focus*

*The restoration and maintenance of healthy ecological systems within watersheds is a primary focus for the future management of the Ely District. Healthy ecological systems are geographically diverse and change over time. They are compatible with soil potential and are resilient to disturbance.*

*Resources and resource uses will be managed to restore or maintain ecological health. Certain resource management changes and active treatments may need to be implemented, in portions of watersheds, to accomplish this objective. Adaptive management will be pursued to avoid deteriorating conditions favoring invasive plants and catastrophic fires. Any projects will be implemented so as to result in a mosaic of vegetation within a watershed.*

*In the long term, natural disturbance (such as drought or fire) will occur and fewer treatments will be needed to maintain ecological health. The result will be a variety of vegetation phases within a watershed, which will provide diverse, healthy conditions for future generations.*



Great Basin ecological system by reducing habitat degradation and fragmentation, and promoting ecological health and vegetation resiliency.

Management of Rocky Mountain bighorn sheep habitats would be generally similar to Alternative A, except that habitat management of high and low elevation habitats would occur directly from active large-scale (i.e., District) restoration and indirectly through wildfire emergency stabilization projects. Implementation of restoration and management actions would promote increased shrub, browse, and forb forage production; escape and thermal cover; and improved breeding and seasonal habitats. Overall habitat quality for this species also would be improved through implementation of the Revised Guidelines for Management of Domestic Sheep and Goats in Native Wild Sheep Habitats (Instructional Memorandum No-98-140).

**Impacts from Other Programs.** Effects to wildlife associated with geology and mineral extraction and invasive and nonnative plant species would be the same as described for Alternative A. Effects to wildlife associated with wild horses, woodland and native plant products, and fire management would be the same as described for Alternative B. Effects to wildlife associated with renewable energy would be the same as described for Alternative C. The following interrelated programs would result in different effects as compared to the previous alternatives.

*Vegetation.* Effects to wildlife from the management of Great Basin ecological systems would be generally similar to those described for Alternative B. Effects to wildlife from the management of Mojave Desert ecological system would be the same as described for Alternative A.

*Lands and Realty.* Effects to wildlife from possible land disposals would be the same as Alternative B except that all lands that are not identified for potential disposal would be retained. As a result, key/crucial wildlife habitat would be disposed of on a case-by-case basis. However, possible land disposals would be evaluated for effects on wildlife and its habitat, in accordance with NEPA.

*Travel Management and Off-highway Vehicle Use and Recreation.* Conflicts with travel management and off-highway vehicle use would be the same as described for Alternative B, except that approximately 734,000 acres would be identified for off-highway vehicle emphasis areas and approximately 1.36 million acres would be established for motorcycle special recreation events. Recreation management also would result in potential increased noise and human presence on approximately 2.7 million acres of habitat in nine special recreation management areas. Implementation of standard operating procedures and best management practices that would reduce potential impacts to wildlife are presented in Appendices H, I, J, and K.

*Livestock Grazing.* Wildlife conflicts with livestock grazing would be similar to those discussed for Alternative A, except that grazing by sheep or goats would be prohibited within 9 miles of desert bighorn habitat and up to 454,000 acres of Rocky Mountain bighorn sheep habitat would likely be improved through the Revised Guidelines for Management of Domestic Sheep and Goats in Native Wild Sheep Habitats (Instructional Memorandum No-98-140), if implemented.



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*Watershed Management.* After standards for rangeland health have been met at the watershed level, wildlife would benefit from additional quality forage that would be managed in a balanced approach with reservation for watershed maintenance and wildlife and allocations to livestock and wild horses in the long term.

**Conclusion.** On a watershed level, restoration activities would result in increased herbaceous forage, increased cover and vegetation structure, and increased habitat quality for wildlife species. On a landscape level, restoration activities would improve wildlife habitats by reducing habitat degradation and fragmentation, promoting ecological health, and improving vegetation resiliency. Increased areas of treatment and widespread use of managed natural fire and prescribed fires would reduce the more severe impact of wildfires.



**4.7 Special Status Species****4.7.1 Plant Species****Impact Issues**

Conservation and recovery of special status plants are dependent upon inventories and monitoring to evaluate species status and trends, as well as active management to remove threats and restore important habitat. Impacts to special status species are generally similar and closely related to impacts to other resources such as vegetation, watersheds, wildlife, wild horses, and livestock.

As stated in Section 3.7.1, a total of 34 special status plants occur or are suspected to occur in the District, of which two species, the Ute ladies'-tresses orchid (federally listed as threatened) and Sunnyside green gentian (species of concern), would be addressed in the Biological Opinion from the U.S. Fish and Wildlife Service. The following impact analyses address potential impacts to these species and potential habitat areas (i.e., vegetation types) as a result of the implementation of the various alternatives, tools and techniques, and resource management programs. Potential impacts to other special status plants (32 species) and their habitats would be addressed in a general fashion.

General threats to sensitive plant populations in the Ely District include off-highway vehicle use, illegal collecting, habitat destruction and disturbance associated with resource extraction or utility and road construction, and livestock and wildlife trampling. Fire management, expansion of noxious weeds and exotic plant species, home and resort development, and livestock grazing currently are having substantial effects on native plant communities in portions of the Ely District (Provencher 2003). Low reproduction rates and climatic events, such as prolonged drought, also affect the continued viability of the populations (Holland 1998; Morefield 1994; Smith 1994).

Desired future conditions for each special status plant species would continue to be developed as data become available.

**Assumptions for Analysis**

None.

**General Impacts from Vegetation Treatment Tools and Techniques**

Please refer to Section 4.5, Vegetation, for general impacts from vegetation tools and techniques. Tools and techniques that may positively or negatively affect special status plants or habitat for these species include fire, chemical treatments, mechanical treatments, and grazing management.



## 4.0 ENVIRONMENTAL CONSEQUENCES

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### Interactions with Other Programs

The special status plant management program within the Ely District potentially would be affected by actions within the resource management programs for vegetation, fish and wildlife, wild horses, lands and realty, renewable energy, travel management and off-highway vehicle use, livestock grazing, geology and mineral extraction, watershed management, fire management, noxious and invasive weed management, and special designations.

**Goal – Manage public land to maintain, restore, improve, or enhance populations and habitats which lead to the recovery of federally-listed species and preclude the need for listings of proposed, candidate, state-protected, or sensitive species.**

### Alternative A

**Impacts from Special Status Species Management Direction.** Although a historic population of Ute ladies'-tresses orchid was observed in Meadow Valley Wash in 1936, this population has not been observed nor have other populations been observed in the Ely District since that time. No active management for this species occurs in the District. The Sunnyside green gentian is known to occur in the Sunnyside/Kirch Wildlife Management Area. Management of habitat for this species would be completed on a case-by-case basis as issues arise. Pre-construction review of proposed projects and disturbances requiring NEPA review would continue to be the primary means of avoiding potential impacts to known or potential habitat for the Ute ladies'-tresses orchid, Sunnyside green gentian, and other special status plants, which would be addressed on a case-by-case basis. Recovery of species and historic habitats would continue to be affected due to lack of occurrence information. A more detailed analysis of potential impacts to special status plants would be completed during watershed and habitat analyses. As part of the standard operating procedures, potential mitigation measures and monitoring would be developed on a site-specific basis.

### **Impacts from Other Programs.**

*Vegetation.* Some of the vegetation management programs that may result in positive effects to potential or known habitats for the Ute ladies'-tresses orchid include the maintenance of current riparian vegetation species and improvement of riparian vegetation towards proper functioning condition. The treatment of exotic species and restoration of select habitat sites within the salt desert shrub community may help protect potential and known habitats for the Sunnyside green gentian. Restoration actions (e.g., prescribed fire, reseeding) within specific habitats would be evaluated on a site-specific basis to avoid or minimize potential impacts to special status plants.

*Fish and Wildlife.* Special riparian use restrictions or limitations that may be implemented on a case-by-case basis to protect nonnative fisheries would avoid or minimize effects to potential habitat for the Ute ladies'-tresses orchid in the long term.



*Wild Horses.* Continued grazing of vegetation by wild horses in herd management areas may damage known or potential habitat for Ute ladies'-tresses orchid, Sunnyside green gentian, or other special status plants.

*Lands and Realty.* Potential land disposals and acquisitions would continue to be evaluated and mitigated, as needed, on a site-specific, case-by-case basis to minimize potential impacts to special status plants. Proposed expansion of existing designated corridors and land and realty actions would be evaluated under NEPA prior to implementation. Potential impacts to special status plants would be addressed in those analyses.

*Renewable Energy.* Potential impacts to known or potential habitat for the Ute ladies'-tresses orchid, Sunnyside green gentian, and other special status plants would be addressed on a case-by-case basis. Disturbances related to known and potential habitat for the Ute ladies'-tresses orchid, Sunnyside green gentian, or other special status plants would continue to be evaluated and mitigated, as needed, on a site-specific, case-by-case basis to minimize potential impacts to special status plants.

*Travel Management and Off-highway Vehicle Use.* New road construction would continue to be evaluated and mitigated, as needed, on a site-specific, case-by-case basis to minimize potential impacts to special status plants. Potential impacts (e.g., trampling of vegetation, soil disturbances) to known and potential habitat for the Ute ladies'-tresses orchid, Sunnyside green gentian, or other special status plants may occur on 9.8 million acres open to off-highway vehicle use and adjacent areas as a result of trespass use.

*Livestock Grazing.* Livestock grazing would continue to occur on approximately 11.2 million acres of rangeland within the District, with no new areas identified for closure. Current grazing practices are not expected to cause deterioration of known and potential habitat for the Ute ladies'-tresses orchid, Sunnyside green gentian, or other special status plants. Grazing management practices and on-going effects would continue to be evaluated and mitigated, as needed, on a site-specific, case-by-case basis to minimize potential impacts to special status plants.

*Mineral Extraction.* Minerals leasing would continue to be evaluated and mitigated, as needed, on a site-specific basis for the protection of special status plants.

*Watershed Management.* A more detailed analysis of potential impacts to special status plants would be completed during watershed and habitat analyses. As part of the standard operating procedures, potential mitigation measures and monitoring would be developed on a site-specific basis.

*Fire Management.* Prescribed fire and managed natural fire would continue to be evaluated and mitigated, as needed, on a site-specific, case-by-case basis to minimize potential impacts to special status plants.

Fire management activities would not likely affect the Ute ladies'-tresses orchid since this species occurs within and near riparian and wetland areas, which are not conducive to carrying wildfires due to the higher



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moisture content of the soils and vegetation. Fire management activities would not likely affect the Sunnyside green gentian since this species occurs in the salt desert shrub community, which likely would not have sufficient natural fuels to support a major fire. Other special status plants that occur in the pinyon-juniper woodland and sagebrush communities may be affected by wildfires since these communities include a sufficient amount of natural fuels that are conducive to carrying wildfires.

*Noxious and Invasive Weed Management.* Noxious and invasive weed treatments would continue to be evaluated and mitigated on a site-specific basis for the protection of special status plant species. Weed infestations could be directly affecting special status plant populations within the District; however, this has not been documented.

*Special Designations.* The three existing ACECs include known populations of four special status plant species. Although prescribed for the specific benefit of the desert tortoise, these ACECs also provide protection for special status plant species due to closures to livestock grazing and off-highway vehicle use.

**Conclusion.** A detailed analysis of potential impacts to special status plants would be completed during watershed and habitat analyses. As part of the standard operating procedures, potential mitigation measures and monitoring would be applied on a site-specific basis. Therefore, implementation of Alternative A would result in minimal short- and long-term impacts to special status plants and enable additional management emphasis for any populations identified during the watershed analysis.

### Alternative B

**Impacts from Special Status Species Management Direction.** Program-specific management actions would include the initiation of a systematic survey of potential habitats for Ute ladies'-tresses orchid. In addition, recovery actions and a conservation strategy for any discovered occurrences of the species or areas with habitat potential for the species would be developed. A detailed monitoring and inventorying plan would be developed to monitor distributions and impacts to both known and potential habitats of Sunnyside green gentian. Corrective actions to maintain and conserve, and restore the species would be implemented after the species distribution and habitats were evaluated. Based on the implementation of these management actions, impacts to Ute ladies'-tresses orchid and the Sunnyside green gentian would be avoided.

A more detailed analysis of potential impacts to other special status plants would be completed during watershed and habitat analyses. As part of the standard operating procedures, potential mitigation measures and monitoring would be developed on a site-specific basis.

**Impacts from Other Programs.** Impacts to special status plants associated with renewable energy, mineral extraction, watershed management, and noxious and invasive weed management activities would be the same as described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.



*Vegetation.* Impacts associated with vegetation treatments would be similar to Alternative A, except one of the objectives is to maintain or restore plant community structure and composition within riparian/wetland areas. Implementation of these treatments would improve the ecological condition of these areas, which would be potential habitat areas for the Ute ladies'-tresses orchid. Vegetation treatments would continue to be evaluated and mitigated, as needed, on a site-specific, case-by-case basis to minimize potential impacts to special status plants.

*Fish and Wildlife.* The elimination of domestic livestock grazing within Rocky Mountain bighorn sheep ranges and migration corridors would improve the condition of known and potential habitat for the Ute ladies'-tresses orchid, Sunnyside green gentian, and other special status plants in the long term.

*Wild Horses.* The management of wild horses within six herd management areas totaling approximately 3.6 million acres would reduce the potential conflicts with habitat for the Ute ladies'-tresses orchid, Sunnyside green gentian, and other special status plants. Known and potential habitat for special status plants located outside of these herd management areas would not be subjected to effects of wild horse grazing in the long term. Vegetation cover and native species diversity within these habitats would likely improve in the long term.

*Lands and Realty.* Impacts as a result of land and realty actions would be the same as Alternative A, except that new designated corridors (0.5 mile wide) could be established. Disposal of lands could only occur in identified areas, with the exception of designated critical habitat for listed threatened and endangered species, and habitat for sensitive species. Land and realty actions would be evaluated under NEPA prior to implementation. Potential impacts to special status plants would be addressed in those analyses.

*Travel Management and Off-highway Vehicle Use.* Potential impacts (e.g., trampling of vegetation, soil disturbances) to known and potential habitat for the Ute ladies'-tresses orchid, Sunnyside green gentian, or other special status plants may occur as a result of off-highway vehicle trespass use in areas adjacent to designated roads and trails. However, eliminating cross-country off-highway vehicle use, limiting off-highway vehicle use to designated roads and trails on 10.3 million acres of land, and closing off-highway vehicle use on an additional 302,000 acres of land would help protect known and potential habitat for special status plants. Known and potential habitat areas for special status species would not be subjected to long-term surface disturbances related to off-highway vehicle use in these areas.

*Livestock Grazing.* Livestock grazing would continue to occur on approximately 7.6 million acres of rangeland within the District. Grazing practices, however, would be modified where necessary to protect known or newly identified populations of Ute ladies'-tresses orchid, Sunnyside green gentian, or other special status plants. The closure of 542,100 acres of rangeland in the Mojave Desert region, approximately 3.0 million acres of bighorn sheep ranges and migration routes, and approximately 26,000 acres of new ACECs would help protect potential habitat for special status plants that may occur within these areas.

*Fire Management.* Potential impacts to special status plants would be avoided through the implementation of projects identified through the watershed and habitat analyses. In addition, potential



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mitigation measures and monitoring would be developed on a site-specific basis for the protection of special status plants. In general, the restoration of vegetation resilience and the return to historical fire regimes would reduce the risk of catastrophic fires that could jeopardize populations of special status species plants.

*Special Designations.* Eighteen new ACECs totaling 147,400 acres would be established for the protection of other resources. The establishment of these ACECs and the land use restrictions associated with these ACECs may have a positive effect on known and potential habitat for special status plants in these areas.

**Conclusion.** The initiation of a systematic survey of potential habitats for the Ute ladies'-tresses orchid, development of recovery actions and a conservation strategy for potential habitat for or possible new occurrences of Ute ladies'-tresses orchid, and development of a detailed monitoring and inventorying plan for the Sunnyside green gentian would provide additional protection and recovery prospects for these species. The establishment of 18 ACECs for the protection of other resources and the land use restrictions associated with these ACECs may offer additional protection where and if special status plants occur in these areas. Therefore, implementation of Alternative B would result in additional protection for special status plants.

### Alternative C

**Impacts from Special Status Species Management Direction.** Potential impacts to Ute ladies'-tresses orchid and Sunnyside green gentian would be similar to those described for Alternative A. As stated for the program-specific impacts associated with Alternative A, a pre-construction review of potential impacts to special status plants would be conducted prior to development. A more detailed analysis of potential impacts to special status plants would be completed during watershed and habitat analyses. As a standard operating procedure, potential mitigation measures and monitoring would be developed on a site-specific basis.

**Impacts from Other Programs.** Impacts to special status plants associated with vegetation, wild horses, renewable energy, mineral extraction, watershed management, noxious and invasive weeds, and special designations management activities would be the same as described for Alternative B. The following interrelated program would result in different impacts compared to Alternative B.

*Fish and Wildlife.* The management of aquatic habitats, more specifically the implementation of special riparian use restrictions or limitations on a case-by-case basis, would improve the quality of potential habitat for the Ute ladies'-tresses orchid.

*Lands and Realty.* Lands and realty management programs would have similar potential impacts to known and potential habitat for the Ute ladies'-tresses orchid, Sunnyside green gentian, and other special status species as described for Alternative A. In addition, new designated corridors (3.0 miles wide) could be established. Pre-construction reviews and detailed analyses would be the same as those described for Alternative A.



*Travel Management and Off-highway Vehicle Use.* Potential impacts (e.g., trampling of vegetation, soil disturbances) to known and potential habitat for the Ute ladies'-tresses orchid, Sunnyside green gentian, or other special status plants may occur as a result of off-highway vehicle trespass use in areas adjacent to designated roads or trails. However, limiting off-highway vehicle use to designated roads and trails on approximately 10.6 million acres of land would have a positive effect on known and potential habitat for special status plants. Known and potential habitat areas for special status species would not be subjected to long-term surface disturbances related to off-highway vehicle use in these areas.

*Livestock Grazing.* The closure of approximately 9,000 acres within three newly designated ACECs to livestock grazing would help protect any potential habitats for special status plants that may exist in those areas in the long term.

*Fire Management.* The suppression of all wildland fires would likely have a minor effect on known and potential habitat for special status plants in the short term. However, the increase in fuel loads over time would increase the likelihood of widespread catastrophic fires in the long term. Populations of special status plants subjected to these catastrophic fires could be eliminated.

*Special Designations.* Twenty new ACECs totaling 142,800 acres would be established for the protection of other resources. The establishment of these ACECs and the land use restrictions associated with these ACECs would offer protection where and if potential habitat for special status plants exists in these areas.

**Conclusion.** A detailed analysis of potential impacts to special status plants would be completed during watershed and habitat analyses. As part of the standard operating procedures, potential mitigation measures and monitoring would be developed on a site-specific basis. In addition, the establishment of 20 ACECs for the protection of other resources and the land use restrictions associated with these ACECs may offer additional protection where and if habitat for special status plants occur in these areas. Therefore, implementation of the Alternative C would result in additional protection for special status plants.

### **Alternative D**

**Impacts from Special Status Species Management Direction.** Impacts to potential habitat for the Ute ladies'-tresses orchid would be the same as described for Alternative B. Impacts to potential and known habitat for the Sunnyside green gentian would be the same as described for Alternative A.

**Impacts from Other Programs.** Impacts to special status plants associated with fish and wildlife, lands and realty, renewable energy, mineral extraction, watershed management, and noxious and invasive weeds activities would be the same as described for Alternative A. The following interrelated program would result in different impacts compared to Alternative A.

*Vegetation.* Vegetation management programs would include the management of riparian areas and would allow these areas to undergo natural processes as nearly as possible. Riparian areas that have invasive or exotic species would be high priority treatment areas. The implementation of these vegetation



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management programs in riparian areas would improve the quality of potential habitat for Ute ladies'-tresses orchid in the District over the long term. The protection of native vegetation communities and prevention of expansion of annual exotic species would help maintain and improve the quality of known and potential habitat for the Sunnyside green gentian by reducing the spread and establishment of invasive species. However, the relative scarcity of vegetation treatments would allow fuels to continue to accumulate. Additional areas would cross one or more ecological thresholds. Crossing the threshold to the tree state could decrease water availability for riparian habitats. Crossing thresholds to high fuels states or states with minimal herbaceous understory could lead to major fires and accelerated soil erosion, thus damaging riparian habitats as well as the watersheds that supply them with water.

*Wild Horses.* Wild horse populations would be allowed to increase without limits on the existing 24 herd management areas. This uncontrolled herd growth would soon eliminate almost all forage, including any special status species plants, within these areas.

*Travel Management and Off-highway Vehicle Use.* Potential impacts (e.g., trampling of vegetation, soil disturbances) to known and potential habitat for the Ute ladies'-tresses orchid, Sunnyside green gentian, or other special status plants may occur as a result of off-highway vehicle trespass use adjacent to designated roads and trails. However, limiting off-highway vehicle use to designated roads and trails on 400,000 acres of land and closing off-highway vehicle use on 11 million acres of land would have a positive effect on known and potential habitat for special status plants. Known and potential habitat areas for special status plants would not be subjected to long-term surface disturbances related to off-highway vehicle use in these areas.

*Livestock Grazing.* The elimination of livestock grazing throughout the District could allow special status plant habitats that have been heavily grazed to recover in the long term, contingent upon the absence of other major disturbances such as fire. Some vegetation communities containing habitat for special status plant species may not fully recover through removal of grazing alone.

*Fire Management.* The minimal suppression of wildfires under this alternative would lead to widespread major fire events that could jeopardize populations of any special status plant species in the affected areas.

*Special Designations.* The removal of ACEC designation from the three existing ACECs would not affect known or potential habitat of special status plants in these areas due to other constraints of this alternative, which would eliminate those uses currently prohibited by this designation.

**Conclusion.** Potential habitat for Ute ladies'-tresses orchid and Sunnyside green gentian could improve in the District with the elimination of grazing and most other physical disturbances. A detailed analysis of potential impacts to special status plants would be completed during watershed and habitat analyses. The additional protection resulting from these measures, however, would be offset by the potential damage to special status plant populations resulting from increased wildfires and uncontrolled wild horse populations under this alternative.



## Alternative E

**Impacts from Special Status Species Management Direction.** Vegetation management programs would include surveying and monitoring federal lands for Ute ladies'-tresses orchid, based on the availability and assistance of the U.S. Fish and Wildlife Service. The U.S. Fish and Wildlife Service would identify potential habitat areas for the species. Conservation and recovery actions would be implemented for any populations observed within the District. Monitoring and inventorying measures to be developed and implemented for the Sunnyside green gentian are the same as those described for Alternative B.

**Impacts from Other Programs.** Impacts to special status plants associated with vegetation, fish and wildlife, wild horses, lands and realty, renewable energy, mineral extraction, watershed management, fire management, noxious and invasive weed management, and special designations would be the same as described for Alternative B.

*Livestock Grazing.* The elimination or restriction of livestock grazing within newly designated ACECs where appropriate and elimination of grazing in desert bighorn sheep habitat would minimize the potential for physical damage to special status plants and deterioration of habitat present within these areas in the short and long term.

*Travel Management and Off-highway Vehicle Use.* The limitation of all vehicular traffic to designated roads would avoid the potential for physical damage to special status plants and deterioration of habitat present in these areas in the short and long term. As part of the watershed analysis, surveys for special status plants would be conducted within potential habitat areas within the District. Therefore, impacts to special status plants are not anticipated to occur within off-highway vehicle emphasis areas.

**Conclusion.** A detailed analysis of potential impacts to special status plants would be completed in conjunction with each watershed and habitat analysis. As part of the standard operating procedures, potential mitigation measures and monitoring would be developed on a site-specific basis. Eighteen new ACECs would be established for the protection of other resources. The establishment of these ACECs and the land use restrictions associated with them may offer additional protection where and if special status plants occur in these areas. Therefore, implementation of Alternative E would result in additional protection for special status plants.

### **4.7.2 Aquatic Species**

#### **Impact Issues**

For aquatic species and their habitats, the primary mechanisms for which management activities could affect sensitive aquatic species include habitat alteration or loss, sedimentation due to soil disturbance and vegetation removal, water quality changes, and reductions in surface water quantity. The focus of the analysis for aquatic species was on occupied or designated critical habitat (i.e., perennial streams, springs, and wetlands) with persistent year-round flow or water availability.



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### Assumptions for Analysis

- Indirect impacts to the Virgin River and Muddy River and those special status species associated with them (i.e., Yuma clapper rail, woundfin, Virgin River chub, and Moapa dace) would be addressed on a case-by-case basis through the NEPA and the Endangered Species Act Section 7 Consultation process.

### Interactions with Other Programs

The Special Status Species Aquatic Management Program within the Ely District potentially would be affected by actions within the resource management programs for water resources, vegetation, fish and wildlife, wild horses, lands and realty, renewable energy, travel management and off-highway vehicle use, recreation, livestock grazing, woodland and native plant products, geology and mineral extraction, watershed management, fire management, noxious and invasive weed management, and special designations.

**Goal – Manage public land to maintain, restore, improve, or enhance populations and habitats which lead to the recovery of federally listed species and preclude the need for listings of proposed, candidate, state-protected, or sensitive species.**

### Alternative A

**Impacts from Special Status Species Management Direction.** Management actions for federally listed species are mandated to comply with Section 7 of the Endangered Species Act. This requirement is reflected in the standard operating procedures. Compliance with the Endangered Species Act requires that any direct or indirect impacts on federally listed species do not jeopardize the species or their designated critical habitat. Management of listed fish species would continue to be focused on maintenance or enhancement of critical habitats on BLM land, which involves three species (Big Spring spinedace, Pahrump poolfish, and White River springfish). Habitat for other sensitive (non-listed) fish species also would be maintained or enhanced. Habitat projects would be implemented on a case-by-case basis. In the riparian habitats of the White River/Pahranagat Valley, adjacent public lands would be managed so that indirect effects would not occur for White River springfish, Hiko White River springfish, or Pahranagat roundtail chub. Management actions identified in the recovery plans (see **Table 3.7-2**) would continue to be implemented.

Numerous management actions applicable to all alternatives would be implemented to minimize or eliminate impacts to special status fish species (Section 2.5.7). Several of these actions also are listed as impact assumptions. A key management action for all species would involve the BLM's participation in the Nevada Department of Wildlife Interagency Implementation Teams to identify and implement actions for the recovery of listed fish species in the Ely District. Specific management actions would be implemented for White River springfish habitats in Ash Springs, as identified in the Ash Spring Coordinated Management Plan. These actions would involve the 72-acre administrative withdrawal of Ash Springs from future land sales and development. Mitigation and monitoring identified in previous Section 7 consultations for this species would



continue to be used. Management actions also would be implemented to minimize indirect effects on fish species that occur in adjacent lands (Virgin River, Muddy River, White River Valley, and Pahranaagat Valley) to the Ely District (see Section 2.5.7).

Specific management actions also would affect Pahrump poolfish under Alternative A. Existing fencing around the Shoshone Ponds would continue to provide some protection to surface disturbance to adjacent lands and habitat for Pahrump poolfish. However, the fencing is not totally effective in eliminating human and livestock access or run-off from adjacent upland areas.

### **Impacts from Other Programs.**

#### *Water Resources.*

All Species. Management of water resources is covered under the watershed restoration program (see previous discussion of watershed analysis and protection of water quality). Additional actions that could occur as part of water resource development include changes in water supply and consumption. If these actions propose to use water sources that affect surface water quantity, reductions in flow or water levels could adversely affect habitat for special status species. These actions would be addressed on a case-by-case basis when specific water uses are identified.

#### *Vegetation.*

Big Spring Spinedace, Pahrump Poolfish, and White River Springfish. If future vegetation treatment (e.g., prescribed fire or chaining) is applied to Upper Meadow Valley Wash (Condor Canyon) or the area surrounding the Shoshone Ponds and Ash Springs, activities would be completed using standard operating procedures and best management practices to minimize any sediment input to the water bodies.

Other Sensitive Species on BLM-administered Land. Potential impacts to other special status fish species (Meadow Valley Wash desert sucker, Meadow Valley Wash speckled dace, White River desert sucker, relict dace, Bonneville cutthroat trout, and springsnails) and sensitive invertebrates (e.g., springsnails) would be similar to those described for the Big Spring spinedace. However, vegetation management actions for Meadow Valley Wash desert sucker and Meadow Valley speckled dace would apply to occupied habitat in both Upper Meadow Valley Wash and Lower Meadow Valley Wash. The lower portion of Meadow Valley Wash is defined as the Clover Creek confluence (near Barclay) to the Clark County line (south of Rox).

Special Status Species on Non-BLM-administered Land. Vegetation treatment in the Ely District would not affect areas occupied by seven federally listed and other special status species on non-BLM-administered land. When considering the drainage characteristics, no indirect effects involving sedimentation or other water quality changes are expected to affect habitat used by these species.



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### *Fish and Wildlife.*

Big Spring Spinedace. Habitat management for nonnative trout species in Upper Meadow Valley Wash and Clover Creek do not overlap with critical habitat for Big Spring spinedace. Therefore, management actions for trout would not affect Big Spring spinedace.

Pahrump Poolfish, and White River Springfish. Habitat management for nonnative trout species would not conflict with occupied or designated critical habitat for these species. Nonnative trout do not occur in Shoshone Ponds or Ash Springs.

Other Sensitive Species on BLM-administered Land. The management of nonnative trout species could result in conflicts with other sensitive aquatic species in terms of competition for food, cover, spawning areas, and other ecological requirements. Conflicts would be addressed on a case-by-case basis for a specific water body.

### *Wild Horses.*

Big Spring Spinedace. Occupied and designated critical habitat for Big Spring spinedace is located adjacent to the Deer Lodge Canyon Herd Management Area, which has an appropriate management level of 30 to 50 horses. Although horse use would not occur within the stream channel, surface disturbance would occur in the area south of Upper Meadow Valley. Sediment could enter the stream during runoff periods.

Pahrump Poolfish and White River Springfish. No wild horse herd management areas currently exist within the BLM's Shoshone Pond Resource Area or Ash Springs, which contain occupied and designated critical habitat for these species. Therefore, wild horses would not affect these species.

Other Sensitive Species on BLM-administered Land. Potential impacts to other special status fish species occurring in Upper and Lower Meadow Valley Wash (Meadow Valley Wash desert sucker and Meadow Valley Wash speckled dace) would be the same as described for the Big Spring spinedace. Sediment-related impacts to springsnail habitats also could occur as a result of horse use of areas surrounding springs in other herd management areas.

Special Status Species on Non-BLM-administered Land. Wild horse herd management areas would not affect areas occupied by the six federally listed species that occur on adjacent non-BLM-administered land.

### *Lands and Realty.*

No identified disposal areas include known populations of special status aquatic species, but a variety of identified potential disposal areas are in close proximity to such populations (approximately 1,100 feet). The management approach under Alternative A specifies that lands would be retained if actions would result in a listing of sensitive species or affect designated critical habitat for federally listed species. Possible land



disposals and acquisitions potentially could result in impacts depending upon the land use actions. Potential impacts could include changes in water quality and quantity or direct alteration of habitat. Beneficial effects could result from land transactions that provide conservation easement or other actions that protect the species. Future transactions would be analyzed on a site-specific basis. Compliance with the Endangered Species Act would require that actions would not jeopardize the continued existence of the species or its designated critical habitat.

### *Travel Management and Off-highway Vehicle Use.*

Big Spring Spinedace, Pahrump Poolfish, and White River Springfish. Use of existing and new transportation corridors could result in short-term, localized sediment input to perennial stream segments. The primary mechanism for sediment effects would involve off-highway vehicle use adjacent to or within stream channels. Soil disturbance from vehicle use could result in sediment runoff from roads into adjacent streams. The construction of new road corridors near streams could result in sediment input due to surface disturbance. By implementing required erosion control measures during construction, sediment impacts to streams would be minor.

Other Sensitive Species on BLM-administered Land. Potential impacts to other special status fish species occurring in Upper and Lower Meadow Valley Wash (Meadow Valley Wash desert sucker and Meadow Valley Wash speckled dace) would be the same as described for Big Spring spinedace (Upper Meadow Valley Wash). Other special status species that could be affected by transportation include White River desert sucker and relict dace (White River) and springsnails.

Special Status Species on Non-BLM-administered Land. Road use on BLM-administered land would not affect areas occupied by seven federally listed species that occur on adjacent non-BLM-administered land.

### *Recreation.*

Big Spring Spinedace and Pahrump Poolfish. Recreation activities under Alternative A could result in vehicle traffic and hiking near Upper Meadow Valley Wash and Shoshone Ponds. Vehicle use could result in localized sediment input to water bodies, as described for travel management and off-highway vehicle use.

White River Springfish. Recreation activities in the Ash Springs area include swimming, picnic use, and hiking. Effects of these activities on habitat for White River springfish could include sedimentation and bottom disturbance.

Other Sensitive Species on BLM-administered Land. Potential impacts to other special status fish species occurring in Upper and Lower Meadow Valley Wash (Meadow Valley Wash desert sucker and Meadow Valley Wash speckled dace) would be similar to other sensitive fish species. Other special status species that could be affected by recreation include White River Wash desert sucker and relict dace (White River) and springsnails.



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Special Status Species on Non-BLM-administered Land. Recreation activities on BLM-administered land would not affect areas occupied by seven federally listed species that occur on adjacent non-BLM-administered land.

### *Livestock Grazing.*

Big Spring Spinedace. No special use restrictions or utilization levels, above BLM general standards and policy, would be established in Upper Meadow Valley Wash. Meadow Valley Wash is located in three grazing allotments (Black Hills, Condor Canyon, and N4/N5). The effects of grazing activities on Big Spring spinedace habitat could include direct alteration to bottom substrate, increased sedimentation, and loss of riparian vegetation. To minimize these types of impacts to Meadow Valley Wash, the BLM prepared the Condor Canyon Habitat Management Plan in 1990. The plan was designed to maintain or improve habitat conditions for this species. The plan recommended excluding livestock grazing within the Canyon between March 15 and November 15, limiting casual vehicle use to the railroad bed, and prohibiting organized competitive or non-competitive vehicle events.

Pahrump Poolfish. No cattle grazing currently exists within the BLM's Shoshone Pond Resource Area, which contains occupied habitat for this species. The BLM has fenced the area around the ponds to restrict grazing. Therefore, livestock grazing would not affect Pahrump poolfish.

White River Springfish. No cattle grazing currently exists on BLM-administered land in the vicinity of Ash Springs. Therefore, cattle grazing would not affect this species.

Other Sensitive Species on BLM-administered Land. Potential impacts to other special status fish species occurring in Upper and Lower Meadow Valley Wash (Meadow Valley Wash desert sucker and Meadow Valley Wash speckled dace) would involve potential sedimentation effects on Meadow Valley Wash during the grazing periods. In Lower Meadow Valley Wash, grazing would occur outside of the southwestern willow flycatcher breeding period. Other special status species that could be adversely affected by grazing include the White River desert sucker and relict dace (White River), Bonneville cutthroat trout (Hampton and Goshute Creeks), Newark Valley tui chub, and springsnails.

Special Status Species on Non-BLM-administered Land. Cattle grazing would not affect areas occupied by six federally listed species that occur on adjacent non-BLM-administered land. Conservation efforts were proposed in 1994 to protect Railroad Valley springfish habitat in Big Warm Spring and Little Warm Spring from cattle grazing (U.S. Fish and Wildlife Service 1996). BLM proposed to reduce the number of livestock in the Duckwater Hills allotment and require that livestock watering be done away from these springs.

### *Woodland and Native Plant Products.*

Big Spring Spinedace. Since Upper Meadow Valley Wash does not occur within an evergreen forest area, impacts associated with wood product harvest would be considered relatively low level



magnitude. However, tree cutting has occurred in the area, particularly after the railroad tracks were removed in 1984 (U.S. Fish and Wildlife Service 1994). Therefore, impacts of tree removal could occur in the future. The types of impacts could include increased erosion, fuel spill risks, and removal of riparian vegetation. It is assumed that activities would not occur within the perennial stream channels to directly alter habitat. The magnitude of potential impacts would depend upon the proximity to the perennial stream, extent of surface disturbance, and drainage characteristics (e.g., gradient and extent of vegetation cover).

Pahrump Poolfish and White River Springfish. No wood harvests are allowed within BLM's Shoshone Pond Resource Area or Ash Springs. Therefore, wood product harvest would not affect these species.

Other Sensitive Species on BLM-administered Land. Potential impacts to other special status fish species occurring in Upper and Lower Meadow Valley Wash (Meadow Valley Wash desert sucker and Meadow Valley Wash speckled dace) would be considered low magnitude due to minimal tree harvesting in the drainage. If wood product harvests occurred in areas near springs or other perennial stream segments, other sensitive fish and invertebrates such as springsnails could be affected on a short-term basis.

Special Status Species on Non-BLM-administered Land. Habitat occupied by the three federally endangered fish species on BLM land does not occur within areas representing potential wood harvest areas (i.e., evergreen forests). In addition, wood harvest areas are not located adjacent to habitat for the six federally listed fish on non-BLM land. Therefore, the wood harvest program is not expected to affect sensitive aquatic species.

### *Mineral Extraction.*

Big Spring Spinedace. Three mining claims exist in the immediate vicinity of Condor Canyon and overlap with Big Spring spinedace designated critical habitat (U.S. Fish and Wildlife Service 1994). These claims presently are inactive. If these claims were activated in the next 20 years, potential impacts to this species from these activities could include loss or alteration of habitat, changes in water quality, and removal of riparian vegetation. No active oil and gas leases overlap with occupied or designated critical habitat for Big Spring spinedace; therefore, oil and gas development would not affect this species.

Pahrump Poolfish and White River Springfish. No historic or future mining or oil and gas development overlap with the area surrounding Shoshone Ponds or Ash Springs. Therefore, these activities would not affect these species.

Other Sensitive Species on BLM-administered Land. Other special status fish species in Upper and Lower Meadow Valley Wash (Meadow Valley Wash desert sucker and Meadow Valley Wash speckled dace) could be affected by future mining, as discussed for Big Spring spinedace. Mining in the garnet rock quarry in the Hampton Creek drainage could affect habitat for Bonneville cutthroat trout. Oil and gas development in Newark Valley could impact Newark Valley tui chub.



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Special Status Species on Non-BLM-administered Land. No historic or future mining is expected to occur in areas surrounding occupied and designated critical habitat for the other seven federally listed fish species that occur on non-BLM-administered land or off-District areas.

### *Watershed Management.*

Big Spring Spinedace. The watershed analysis for Panaca Valley, which contains critical habitat for Big Spring spinedace in Condor Canyon, is considered a high priority in the assessment schedule. The assessments will determine the physical and biological conditions of a watershed. During the implementation phase of the watershed analysis, recommendations will be made to restore habitat features that are impaired or not functioning satisfactorily. In the long-term, the watershed analysis will help to improve aquatic habitat. However, until the assessments are completed, current conditions in water resources will continue.

Pahrump Poolfish. The Shoshone Ponds area is included among the high priority watersheds.

White River Springfish. The Ash Springs area is included among the high priority watersheds.

Other Sensitive Species on BLM-administered Land. Watershed analyses in Meadow Valley Wash, which are on the high priority list, also would be helpful in identifying habitat concerns for Meadow Valley Wash desert sucker and Meadow Valley Wash speckled dace. Other special status species that could benefit from watershed analyses include White River desert sucker and Preston White River Valley springfish (White River North is a high priority watershed), Moorman White River springfish (White River South is a high priority watershed), and Bonneville cutthroat trout (Deep Creek and Snake Valley North are low priority watersheds while Snake South is a high priority watershed). As stated above, current trends in water bodies would continue until habitat restoration is implemented. Habitat for springsnails would improve at scattered spring locations throughout the Ely District, with the timing of improvements depending on the schedule of the various watershed assessments and subsequent treatments.

Special Status Species on Non-BLM-administered Land. Watershed analyses for the BLM-administered lands adjacent to the federally listed species that occur on state or private land include a combination of high and low priority watersheds.

### *Fire Management.*

All Species. If prescribed and managed natural fires are conducted in areas containing habitat for special status species, effects could be the short-term loss of understory and woody debris, which provides cover and shading for aquatic species. Within 10 years, vegetation would recover along the streams and provide cover attributes with a lower fire risk. Restoration of woody vegetation in riparian areas could take longer than 10 years.

The potential for large uncontrolled wildfires would exist throughout the next 20 years. Increased erosion and sediment input to streams likely would occur in these burned areas due to the loss of vegetation.



Big Spring Spinedace. Under this alternative, the restoration efforts would continue to focus on mitigation. Restoration and recovery efforts would focus on mitigating the direct and indirect effects of post-wildfire on Condor Canyon and the associated aquatic habitats.

Other Sensitive Species on BLM-administered Land. Habitat restoration for Meadow Valley Wash desert sucker and Meadow Valley Wash speckled dace would focus on stabilization projects in areas burned by wildfires in Upper and Lower Meadow Valley Wash.

*Noxious and Invasive Weed Management.*

Big Spring Spinedace. Noxious and invasive weed management activities would result in varying effects on Big Spring spinedace habitat. The mechanical removal of weeds would result in soil disturbance, which could contribute increased sediment input into Meadow Valley Wash during runoff events. Increased sediment could alter fish habitat by covering bottom substrates or adversely affecting macroinvertebrate food sources for fish. The duration of sediment-related effects would be short-term in duration (i.e., several months to several years until new vegetation is established). The eradication of monotypic tamarisk stands along Upper Meadow Valley Wash would remove overhanging cover that provides shade and streamside structure. Most mixed canopy tamarisk along Upper Meadow Valley Wash has already been removed. Removal of tamarisk also could result in localized sediment increases due to reduced bank stability. After new vegetation is established in several years, cover and bank stability would be replaced along the stream. The effect of tamarisk removal on fish habitat would be the potential increased water quantity in streams. Tamarisk consumes relatively high amounts of water compared to other vegetation.

Pahrump Poolfish and White River Springfish. Noxious and invasive weed management would not affect habitat for these species, since no treatment is planned for the area surrounding the Shoshone Ponds or Ash Springs at this time. If future weed treatments occurred near these water bodies, potential effects could involve sedimentation from surface disturbance as part of nonchemical treatment. By following standard operating procedures, chemical weed treatment would not be expected to affect water quality.

Other Sensitive Species on BLM-administered Land. Potential effects of weed treatment on other special status species (i.e., Meadow Valley Wash desert sucker, Meadow Valley Wash speckled dace, White River desert sucker, relict dace, Bonneville cutthroat trout, and springsnails) would be the same as described for Big Spring spinedace. Habitat restoration for the Meadow Valley Wash desert sucker and Meadow Valley Wash speckled dace would focus on the control of tamarisk in Upper and Lower Meadow Valley Wash.

Special Status Species on Non-BLM-administered Land. Noxious weed management activities would not affect areas occupied by six federally listed and other special status species on non-BLM-administered land. When considering the drainage characteristics, no indirect effects involving sedimentation or other water quality changes are expected to affect habitat used by these species.



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### *Special Designations.*

All Species. Under Alternative A, no new special designations would be implemented. In addition, the three existing ACECs (Beaver Dam, Kane Springs, and Mormon Mesa) do not overlap with habitat for sensitive aquatic species. Therefore, special designations would not affect sensitive fish and invertebrate species.

**Conclusion.** Management for sensitive fish and invertebrate species would focus on the maintenance, mitigation, and restoration of habitat, as identified in the management and recovery plans for the species. Habitat for Pahrump poolfish in the Shoshone Ponds would be protected by fencing around the ponds. Other programs would continue to result in sedimentation and habitat alteration due to surface disturbance. Development of disposed lands could involve uses with water consumption requirements that could affect habitat through changes in flow or water level.

### Alternative B

**Impacts from Special Status Species Management Direction.** Management for special status aquatic species under Alternative B would involve numerous actions that are applicable to all alternatives (Section 2.5.7.2). In addition, species would be managed through evaluations of their overall specific habitat conditions and factors affecting their populations at the large-scale (Ely District) and proactively resolved through habitat restoration and multiple use restrictions at the mid-scale (i.e., watershed). Maintenance and mitigation measures would continue to be implemented where multiple-use impacts occur or where habitat or populations are at or near their maximum natural levels.

Habitat for the Pahrump poolfish would be improved under Alternative B by building a new fence around Shoshone pond to exclude both human and livestock access. The fenced area also would be expanded in size to exclude new surface disturbance and minimize sedimentation and runoff from upland areas. The fenced area would be reseeded to minimize sedimentation input to the ponds.

**Impacts from Other Programs.** Impacts to sensitive aquatic species and their habitat associated with water resources, wild horse, renewable energy, travel management and off-highway vehicle use, woodland and native plant products, and noxious and invasive weed management would be the same as described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

### *Vegetation.*

All Species. If vegetation treatments increased under this alternative in drainages containing habitat for special status species, short-term erosion could contribute sediment to downgradient areas. However, any sediment input is expected to be low, since treatment measures would implement erosion control measures. In the long-term, vegetation treatments would be expected to improve habitat conditions for special status aquatic species.



### *Fish and Wildlife.*

Big Spring Spinedace. Since occupied habitat for trout in Upper Meadow Valley Wash do not overlap with critical habitat for Big Spring spinedace, management actions for trout species would not affect this species.

Pahrump Poolfish, and White River Springfish. Habitat management for nonnative fish species would not affect these species, since trout populations do not occur in Meadow Valley Wash, Shoshone Ponds, or Ash Springs.

Other Sensitive Species on BLM-administered Land. Under this alternative, nonnative fisheries would be actively managed to maintain or enhance existing populations. In water bodies that contain nonnative and native special status fish species, management emphasis would be on the habitat requirements of native fish species.

*Lands and Realty.* No potential land disposal areas under Alternative B are located within or immediately adjacent to any special status aquatic species habitat, but some occur within distances less than 1,000 feet. No land disposals would be allowed in areas that contain designated critical habitat for federally listed fish species on BLM land (Big Springs spinedace, Pahrump poolfish, and White River springfish).

*Recreation.* Dispersed recreation would occur in eight special recreation management areas. Potential impacts of recreation activities on special status aquatic species could include sedimentation and habitat alteration. However, as part of the planning process for development of new recreation areas, management would be done in a manner that would minimize effects on water bodies.

### *Livestock Grazing.*

Big Spring Spinedace. The potential effects of grazing on designated critical habitat for this species in Upper Meadow Valley Wash could be reduced, since grazing would either be closed in relation to bighorn sheep habitat or restricted or not allowed until the revegetation objectives are met based on the watershed management program.

Pahrump Poolfish. A new fence would be built to exclude livestock grazing near the Shoshone Ponds. The fenced area also would be expanded to exclude a larger area from grazing.

White River Springfish. No additional changes in the Ash Springs area would be implemented as part of Alternative B.

Other Sensitive Species on BLM-administered Land. Restrictions in grazing for desert tortoise and bighorn sheep habitat also would reduce impacts to habitat for other special status species such as the Meadow Valley Wash desert sucker and Meadow Valley Wash speckled dace in Upper and Lower Meadow Valley Wash, the White River desert sucker and relict dace in the White River, and springsnails at scattered



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locations throughout the Ely District. Livestock grazing would be excluded from all areas of Lower Meadow Valley Wash to protect and initiate conservation and restoration of aquatic habitat for Meadow Valley speckled dace and Meadow Valley Wash desert sucker.

Special Status Species on Non-BLM-administered Land. Livestock grazing in the Ely District would not affect areas occupied by seven federally listed and other special status species on non-BLM-administered land. When considering the drainage characteristics, no indirect effects involving sedimentation or other water quality changes are expected to affect habitat used by these species. Livestock grazing would be excluded from most of the Mojave Desert in conjunction with protection of desert tortoise and bighorn sheep habitat.

### *Mineral Extraction.*

Big Spring Spinedace. The effects of mining on Big Spring spinedace would be the same as discussed for Alternative A. Since Upper Meadow Valley Wash is located within a high potential oil and gas development area, this drainage could be affected by construction and operation activities if a lease is approved. Future development activities would have to be done with conditions to protect Big Spring spinedace and its designated critical habitat.

Pahrump Poolfish and White River Springfish. Mining and oil and gas development would not affect these species, as discussed in Alternative A.

Other Sensitive Species on BLM-administered Land. Other special status fish species in Upper and Lower Meadow Valley Wash (Meadow Valley desert sucker and Meadow Valley speckled dace) could be affected by future mining, as discussed for Big Spring spinedace. Mining in areas containing perennial stream segments and springs also could affect other sensitive fish and springsnail species.

Special Status Species on Non-BLM-administered Land. Mining is not expected to occur in areas surrounding occupied and designated critical habitat for the other seven federally listed fish species that occur on non-BLM-administered land or off-District areas. Oil and gas development in high potential areas could disturb BLM-administered land that is adjacent to private or state land that contains habitat for White River spinedace. The types of potential impacts would be the same as discussed for Alternative A. Oil and gas development would not affect federally listed Hiko White River springfish, Pahranaagat roundtail chub, Railroad Valley springfish, Virgin River chub, woundfin, or other special status species, since no high potential areas overlap with habitat for these species.

### *Watershed Management.*

All Species. Habitat conditions for several special status species fishes and springsnails would be addressed in watersheds listed as high priority areas. Specifically, this would involve Meadow Valley North and South and Clover Creek North and South for Big Spring spinedace; White River South for Hiko White River springfish, White River springfish, and Pahranaagat roundtail chub; Railroad Valley for Railroad Valley springfish; White River North and Central for White River spinedace, and Spring Valley for Pahrump



poolfish. Management would identify and help restore habitat parameters important to fish and invertebrate resources such as riparian development and stream bank stability. In the Pahranaagat Valley/Ash Springs area, watershed analyses would need to address indirect impacts to private riparian (lentic and lotic environments) and take corrective action to minimize or eliminate impacts to White River springfish.

Big Spring Spinedace. The effects of the Panaca Valley watershed assessment on habitat in the Condor Canyon portion of the Upper Meadow Valley Wash would be the same as described for Alternative A. On a long-term basis, habitat conditions could improve for parameters such as riparian vegetation and stream bank stability. In addition, a habitat inventory and ACEC Management and Restoration Plan would be completed for the Condor Canyon portion of Panaca Valley. Additional details related to this plan are discussed under Special Designations.

Meadow Valley Desert Sucker and Meadow Valley Wash Speckled Dace. Meadow Valley Wash North, Meadow Valley Wash South, Clover Creek North, and Clover Creek South would be a high priority for watershed analyses, which is the same as Alternative A. In the long-term, restoration efforts could improve habitat conditions for these species. Until restoration is initiated, existing habitat problems would continue to affect the species.

White River Springfish, Hiko White River Springfish, and Pahranaagat Roundtail Chub. Watershed analyses for White River South and White River North would help in identifying any additional management actions that could be used to protect, enhance, and restore habitat for these species.

### *Fire Management.*

All Species. In general, fire management would result in a more widespread treatment area to prevent heavy fuel accumulation. This management approach would result in a reduced risk of catastrophic fires compared to Alternative A. The effect of this type of fire management on aquatic habitat would be reduced erosion input to perennial drainages due to increased soil stability on a long-term basis. In the short-term period, there would be a loss of understory and woody debris in drainages, which could result in increased erosion to perennial stream segments and springs. Restoration of vegetation resilience and return to historical fire regimes would reduce impacts to aquatic special status species when fires occur.

### *Special Designations.*

Big Spring Spinedace. The habitat inventory and ACEC Management and Restoration Plan conducted in conjunction with the watershed analysis process would determine the factors that have degraded habitat for Big Spring spinedace. A restoration strategy then would be prepared to protect and conserve habitat for this species. In the short-term, habitat problems in Condor Canyon would continue. It is anticipated that it would take at least 5 to 10 years before habitat conditions would improve for these species.

Meadow Valley Wash Desert Sucker and Meadow Valley Wash Speckled Dace. Special designations for Upper Meadow Wash also would help improve habitat in the long term for these species.



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The Rainbow, Carp, and Rox portions of Lower Meadow Valley Wash would be designated as the Lower Meadow Valley Wash ACEC. The recovery and conservation actions identified in the southwestern willow flycatcher would be the basis for the ACEC Restoration and Management Plan. It is anticipated that it would take at least 5 to 10 years before habitat conditions would improve for these species.

**Conclusion.** Sensitive fish and invertebrate species would be managed through evaluations of their overall habitat conditions. Numerous resource uses could affect sensitive aquatic habitat as a result of sedimentation, vegetation removal, or habitat alteration. However, grazing impacts would be eliminated. Vegetation management could result in greater short-term impacts through erosion and sedimentation as a result of increased treatment areas. Management and restoration plans with two new ACECs would help restore habitat for fish species in Condor Canyon and Lower Meadow Valley Wash. On a long-term basis, the restoration of vegetation resilience in riparian areas and the surrounding uplands would improve habitat conditions for sensitive fish and invertebrate species.

### Alternative C

**Impacts from Special Status Species Management Direction.** Program-specific impacts under this alternative would be similar to Alternative A. Surface disturbance and sediment-related impacts to Pahrump poolfish would be reduced, since the fencing around the Shoshone Ponds would be repaired to its original size and specifications.

**Impacts from Other Programs.** Impacts to sensitive aquatic species and their habitat associated with water resources, wild horse, renewable energy, livestock grazing, woodland and native plant products, geology and mineral extraction, and noxious and invasive weed management would be similar to those described for Alternative A. Effects associated with vegetation, watershed management, travel management and off-highway vehicle use, and oil and gas development management activities would be the same as described for Alternative B. The following interrelated programs would result in different impacts compared to Alternatives A and B.

*Fish and Wildlife.* The effects on sensitive aquatic species associated with fish management activities would be the same as discussed for Alternative A except that nonnative fisheries would be enhanced rather than maintained. This could result in more conflicts with native special status fish species. Conflicts would be mitigated on a case-by-case basis.

*Lands and Realty.* No habitat for special status fish species is located within possible land disposal areas for Alternative C, but some habitat occurs within 1,000 feet of identified potential disposal areas. More instances of such proximity occur in Alternative C than in Alternative B.

*Recreation.* Recreation activities could increase under this alternative, which could result in surface disturbance near water bodies containing special status aquatic species. However, management would be done in a manner that would minimize effects to water bodies.



*Fire Management.* The effects of fire management under Alternative C would vary for treated and untreated areas. There would be a buildup of fuel materials in untreated areas, which could contribute to the probability of a major wildfire event with subsequent erosion input to drainages. Treated areas would reduce material buildup, which would reduce erosion input to drainages on a long-term basis.

*Special Designations.*

Big Spring Spinedace. The Condor Canyon ACEC would be managed as a multiple use area with managed recreational development. Recreational use in Condor Canyon could result in increased surface disturbance and sediment input to Meadow Valley Wash, which could affect habitat for Big Spring spinedace.

Meadow Valley Wash Desert Sucker and Meadow Valley Wash Speckled Dace. Potential sediment-related impacts in the Condor Canyon ACEC also could affect these species. The Lower Meadow Valley Wash ACEC would be managed as a multiple use area with managed recreational development. Recreational use in Lower Meadow Valley Wash could result in increased surface disturbance and sediment input to the drainage, which could affect habitat for Meadow Valley Wash desert sucker and Meadow Valley speckled dace.

**Conclusion.** Program-specific impacts would be similar to Alternative A. However, sediment-related impacts to Pahrump poolfish could be reduced by fence repair around Shoshone Ponds. Most other programs would result in the same types of impacts discussed for Alternatives A or B. Increased recreation activities could result in additional surface disturbance and sediment impacts on habitat for sensitive aquatic species.

### **Alternative D**

**Impacts from Special Status Species Management Direction.** Management of special status fish species under Alternative D would involve a passive and indirect approach to restore habitat throughout the District through the exclusion of discretionary commodity uses of public lands. Natural processes would be allowed to restore degraded habitats and determine future habitat conditions. Any active habitat management would emphasize restoration of human-induced changes to the natural environment and the protection of large-core areas of existing intact habitats. The effects of this management approach would be improvement in habitat conditions as a result of decreased surface disturbance and surface runoff into watersheds. An exception would be when and where this approach leads to crossing thresholds that cause future vegetation states to inadequately protect watersheds. Some of those areas then would be subject to accelerated erosion due to inadequate vegetation cover, especially where and when the future state burns frequently. Passive management could require a relatively long timeframe (10 to 20 years or longer) before aquatic habitat conditions improve. Direct management involving restoration of human-induced effects on watersheds could be implemented in a shorter timeframe. Restoration efforts would focus on excluding use in riparian areas. As a result, stream banks could become more stabilized and overhanging vegetation along water bodies could be more developed.



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**Impacts from Other Programs.** Impacts to sensitive aquatic species and their habitat associated with water resources, noxious and invasive weed management, and special designations management activities would be the same as described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Vegetation.* Management of riparian areas would involve prohibiting land-disturbing activities. Natural processes would be allowed to occur in riparian areas, which would help stabilize stream banks and provide overhanging cover for aquatic species.

*Wild Horses.* Habitat for fish and invertebrate species could be affected by wild horse grazing and physical disturbance in the 24 herd management areas where herd growth would be uncontrolled. Streams could include Upper Meadow Wash (Big Spring Spinedace, Meadow Valley Wash Speckled dace, and Meadow Valley Wash desert sucker) and Goshute Creek (Bonneville cutthroat trout). Impacts to unfenced springs could affect habitat for springsnails.

*Lands and Realty.* Impacts associated with lands and realty would be similar to Alternative A and would not be expected to affect habitat for special status fish species.

*Renewable Energy.* Habitat for sensitive aquatic species would not be affected by this program, since there would be no issuance of rights-of-way for renewable energy development.

*Travel Management and Off-highway Vehicle Use.* Based on a reduction of off-highway vehicle, surface disturbance in watersheds would be reduced under Alternative D. As a result, sediment input to streams from off-highway use would be reduced, which would improve habitat for special status aquatic species.

*Recreation.* Impacts to aquatic habitat could occur under this alternative, as a result of an increase in dispersed recreation. The types of impacts could include erosion or water quality changes, if activities occurred in stream or springs inhabited by sensitive fish or invertebrate species.

*Livestock Grazing.* Livestock grazing would be eliminated throughout the Ely District, which would eliminate future impacts to special status species habitat such as surface disturbance/sedimentation, loss of riparian vegetation, and direct alteration of stream channel habitat.

*Woodland and Native Plant Products.* Habitat for sensitive aquatic species would not be affected by this program, since there would be no fuelwood collection or other wood products harvests.

*Mineral Extraction.* Effects of mineral development activities on habitat for aquatic special status species would be substantially reduced in Alternative D, since there would be no new mineral leasing or sales. Surface disturbance could occur to approximately 7,500 acres within 4.2 million acres of land open to locatable mineral entry.



*Watershed Management.* In the short term, Alternative D would have minimal impacts to special status aquatic species, as watershed restoration would be primarily passive. The elimination of grazing and limited vegetation treatment in riparian areas would reduce and minimize stream sedimentation. However in the long term, the loss of resiliency in many of the vegetation communities surrounding aquatic habitat would place these habitats in greater jeopardy from catastrophic wildfires and increased erosion and sedimentation.

*Fire Management.* The effects of fire management on aquatic habitat would be similar to Alternative C except that in the absence of grazing and fire suppression, there would be a short-term buildup of fire fuels followed by a higher probability of widespread wildfires. In terms of effects on aquatic habitat, there would be greater risk of fires burning in drainages, which would result in higher erosion impacts on both a short- and long-term basis.

**Conclusion.** Emphasis on passive management of sensitive aquatic species through exclusion of commodity uses on public lands could result in improved habitat conditions. Greater impacts to nonnative fisheries habitat would occur due to uncontrolled wild horse population use in herd management areas, increased dispersed recreation, and fire management with minimal fire suppression. Less erosion would occur from vegetation treatment, but far more would occur from widespread wildfires.

### Alternative E

**Impacts from Special Status Species Management Direction.** The effects of management actions under Alternative E would be the same as Alternative B.

**Impacts from Other Programs.** Impacts to sensitive aquatic species and their habitat as a result of most other programs would be the same as described for Alternative B. The programs that would result in different impacts are discussed below.

*Fish and Wildlife.* Impacts of this program would be the same as Alternative B except that the BLM would work with the Nevada Department of Wildlife to enhance native fisheries wherever possible and provide a balance between nonnative and native fisheries. The management emphasis would be to identify, minimize, or eliminate conflicts between native and nonnative fisheries. This type of management would be beneficial to special status fish species, which are native fish.

*Livestock Grazing.* The establishment of livestock grazing restrictions would result in improved habitat conditions in riparian areas within Lower Meadow Valley Wash and the White River drainage (Mojave Desert). Restricted grazing would provide more developed riparian areas, increased bank stability, and reduced sediment input to the watersheds.

**Conclusion.** Sensitive fish and invertebrate species would be managed through evaluations of their overall habitat conditions. Numerous resource uses could affect sensitive aquatic habitat as a result of sedimentation, vegetation removal, or habitat alteration. Changes in grazing management in riparian areas could improve habitat conditions in the long-term period in the Lower Meadow Valley Wash and White River



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drainages. Vegetation management could result in greater short-term impacts through erosion and sedimentation as a result of increased treatment areas. Management and restoration plans with two new ACECs would help restore habitat for fish species in Condor Canyon and Lower Meadow Valley Wash. On a long-term basis, the restoration of vegetation resilience in riparian areas and the surrounding uplands would improve habitat conditions for sensitive fish and invertebrate species.

### 4.7.3 Wildlife Species

#### Impact Issues

The effects analysis for special status wildlife species focused on those species that were identified as potentially occurring within the Ely District (see Appendix F, Special Status Species). The primary impact issues to special status species as they relate to resource conflicts with other management programs include loss or alteration of native habitats, increased expansion of noxious weeds and other exotic weed species, decreased water availability, increased habitat fragmentation, changes in habitat and species composition, and direct loss of individuals. Desired future conditions for each special status wildlife species would continue to be developed as data become available. Impacts to special status species would be similar and closely related to impacts to vegetation and watersheds.

These desired future conditions would be patterned after those presented for sage grouse (Appendix M, Wildlife Desired Future Conditions) and would be consistent with the desired ranges of conditions shown for vegetation in Chapter 2.0. Desired future conditions would be used as a tool to manage special status species wildlife within the District.

#### Assumptions for Analysis

- Indirect impacts to the Virgin River and Muddy River and those special status species associated with them (i.e., Yuma clapper rail [federal endangered species]) would be addressed on a case-by-case basis through NEPA and the Endangered Species Act Section 7 consultation process.

#### General impacts from Special Status Species Treatments Tools and Techniques

Treatment tools for special status species are summarized in Appendix E along with the tools used in conjunction with various other resource programs. The following paragraphs provide a general overview of the impacts anticipated from the use of major special status species treatment tools. Standard operating procedures and best management practices that would reduce potential impacts to wildlife are presented in Appendices B, H, I, J, K, L, and N.

**Bat gates.** Bat gates are commonly installed at the entrance of caves and mines to protect human health and safety as well as important bat habitats and minimize potential impacts to roosting bats.

**Water escape ramps.** Escape ramps such as ladders or other devices would minimize potential impacts to small mammals and herptiles from becoming trapped in manmade water bodies (e.g., guzzlers).



**Temporal Restrictions.** In many cases, temporal restriction are used to restrict recreation, development, treatment, and other permitted activities during sensitive breeding and seasonal periods for special status species. Temporal restriction would minimize potential impacts to special status species from direct disturbance of habitat and indirect effects from increased noise and human presence.

**Livestock fencing.** Livestock fencing is commonly used to control livestock distribution and to exclude livestock from important breeding or seasonal special status species habitats (e.g., riparian zones). Wildlife would generally benefit from the exclusion of livestock by increasing available forage and water resources, improving breeding and seasonal habitats, and reducing habitat degradation.

**Prescribed fire.** Prescribed fire would be used primarily to reduce heavy fuel loading in relatively small areas and improve habitat to desired ranges of vegetation conditions. In the short term, localized fire prescriptions would generally benefit special status species by increasing quantity and quality of herbaceous forage and ground cover, and improve breeding and seasonal habitats for wildlife in the long term.

**Telemetry.** Radio-telemetry is a common tool used to acquire detailed data on many aspects of wildlife biology, including habitat use, home range size, mortality and survivorship, and migration timing and routes. Since many wildlife species are secretive and difficult to observe, radio-telemetry provides a valuable tool to learn more about a species' life-history. Because of the invasive nature of telemetry projects, impacts can occur from animals that are unduly stressed or influenced by the capture technique, and the animal wearing the radio tag may not behave in a representative manner for the species.

### **Interactions with Other Programs**

The Special Status Species Wildlife management program within the Ely District potentially would be affected by actions within the resource management programs for water resources, vegetation, fish and wildlife, wild horses, lands and realty, renewable energy, travel management and off-highway vehicle use, recreation, livestock grazing, woodland and native plant products, geology and mineral extraction, watershed management, fire management, noxious and invasive weed management, and special designations.

**Goal – Manage public land to maintain, restore, improve, or enhance populations and habitats which lead to the recovery of federally listed species and preclude the need for listings of proposed, candidate, state-protected, or sensitive species.**

### **Alternative A**

**Impacts from Special Status Species Management Direction.** Management of special status species would continue to occur predominantly at a fine scale (i.e., allotment, project, or portion of a watershed) and occasionally at the large scale (i.e., District) through management actions that address an immediate need or habitat niche for the maintenance, mitigation, and restoration of a single special status species on a case-by-case basis. Special status species that have been identified occurring within District boundary are



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presented in Appendix F, Special Status Species. Implementation of this alternative would include restoration activities that would be managed to achieve desired range of conditions for vegetation communities (see Section 2.5.5, Vegetation). The historic restoration rate of approximately 10,000 acres per year is not considered an adequate rate of habitat restoration, given the historic trends in habitat degradation, fragmentation, and spread of invasive vegetation species that has occurred on the District. With continued deterioration of these communities and resultant loss of habitat for several special status species, particularly those that inhabit sagebrush and salt desert shrub communities, the probability continues to increase for additional listing of such species under the Endangered Species Act. Listing of one or more species within this complex of sensitive species easily could impose major constraints on other multiple uses within the District.

Habitat for cave roosting bats would be managed through the implementation of the Ely District Cave Management Plan by restricting actions and activities that could impact sensitive roost areas (e.g., hibernaculum, maternity roost, bachelor roosts) on the District. Under this alternative, cave roosting habitat would receive protection from other program activities (e.g., recreation). Protection of other roosting habitat (e.g., rock outcrops, vegetation) and restoration projects to promote or restore foraging habitats (e.g., riparian, pinyon-juniper) would not be a priority under this alternative. As a result, degradation of foraging and some roosting habitat for bat species would continue.

Within riparian habitats of the Mojave Desert and Great Basin ecological systems, restoration activities within Meadow Valley Wash would focus on controlling the spread of tamarisk and other invasive weeds, and emergency stabilization projects within wildfire burn areas on a case-by-case basis. Conflicts would include short-term localized habitat disturbance from habitat restoration projects and the incremental reduction of potentially suitable habitat for species that utilize tamarisk (e.g., southwestern willow flycatcher, yellow-billed cuckoo, Arizona southwestern toad). Implementation of standard operating procedures and best management practices that would minimize or prevent potential impacts to special status species are present in Appendices B, H, I, J, K, L, and N. In addition, since no special use restrictions or utilization levels, above BLM general standards and policy, have been established for Meadow Valley Wash, effects from grazing would continue to result in a reduction in herbaceous and shrub cover and overall nesting and foraging structure for special status species that utilize riparian habitat (see Appendix F, Special Status Species).

Within desert scrub habitats of the Mojave Desert ecological system, it is anticipated that special status species (e.g., desert tortoise and banded gila monster) would continue to receive protection from the restrictions and standard operating procedures developed for desert tortoise in the 2000 Caliente MFP Amendment. As a result, multiple use management actions that may impact the habitat of Mojave Desert special status species would be assessed on a case-by-case basis. Implementation of standard operating procedures that would reduce potential impacts to desert tortoise are presented in Appendix I. Under this alternative, special status species in the Mojave Desert ecological system would continue to experience watershed level effects from increased displacement by red brome and other invasive species, and a reduction of native herbaceous understory. However, special status species in the Mojave Desert ecological system would continue to benefit from the exclusion of livestock grazing within designated desert tortoise ACECs (approximately 212,500 acres) and special use restrictions that have been developed for non-ACEC



desert tortoise. This management direction would provide higher quality forage (i.e., grasses and forbs) and cover within these areas.

Within Mojave Desert mountain and desert scrub habitats, desert bighorn sheep would be maintained in a percentage of their historic range and in portions of their current seasonal habitats. Management of high and low elevation habitats would occur indirectly and on a small scale through wildfire emergency stabilization projects. As a result, some degradation of bighorn sheep habitat would continue to occur. Restrictive barriers that limit migration between seasonal habitats and other populations would remain. However, habitat quality for this species would likely be improved through the Revised Guidelines for Management of Domestic Sheep and Goats in Native Wild Sheep Habitats (Instructional Memorandum No-98-140), if implemented.

Management of western burrowing owls and other special status species within desert scrub and salt desert shrub habitats of the Mojave Desert and Great Basin ecological systems would occur on a case-by-case basis, as needed. No habitat analyses, systematic breeding surveys, or proactive actions to promote habitat conditions for the burrowing owl or other desert scrub or salt desert shrub dependent special status species would occur under this alternative. As a result, habitat for special status species within desert scrub or salt desert shrub communities would continue to be affected primarily by management of other uses such as livestock grazing, fire management, and recreation.

Within sagebrush habitats of the Great Basin ecological system, greater sage-grouse would be emphasized over other BLM Sensitive Species. Sage grouse management actions would be implemented based on potential projects identified through large-scale habitat estimates performed through local sage grouse conservation plans. Priorities for assessing and monitoring sage grouse habitat conditions in sagebrush communities would be established and would occur periodically or as more data become available, through the local sage grouse conservation plans. Under this alternative, there are no long-term management actions identified for sage grouse habitat management. Long-term management actions for sage grouse would be implemented through future recommendations from local sage grouse planning teams or through actions identified through watershed analysis.

There would be no established approach or prioritization to maintain quality sagebrush habitats. Sagebrush habitat maintenance would be performed in consideration of the priorities identified in the BLM National Sage Grouse Conservation Strategy. Allowable sage grouse habitats uses would continue to be managed in consideration of best management practices, with blanket restrictions on surface disturbing activities and survey requirements as outlined in the Ely District MFPs and activity plans. Potential impacts to sage grouse from surface disturbing activities, particularly during breeding and nesting, would be reduced further through the implementation of applicable standard operating procedures presented in Appendix K. As a result, sage grouse habitat would continue to be managed reactively, rather than proactively, in response to habitat needs or projects on a site-specific basis.

Sage grouse habitat restoration would occur at a small scale and through various projects identified in local sage grouse conservation plans. Sagebrush restoration would be centered on restoring potential sagebrush habitats occupied by pinyon or juniper and in consideration of the restoration priorities identified in the BLM



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National Sage Grouse Conservation Strategy. Allowable use restrictions would not exist for sagebrush habitats undergoing restoration. Livestock would be excluded from using post wildfire restorations for a minimum of two years. As a result, landscape level effects to sagebrush-dependent special status species would continue to result from general habitat degradation, habitat fragmentation, and a reduction in ecological health and resiliency.

### Impacts from Other Programs.

*Vegetation.* Vegetation treatments and maintenance within the Great Basin ecological system would continue at or somewhat above historic rates with the majority of the treatment being managed natural fire followed by seedings where necessary. Treatment and maintenance activities would occur primarily in pinyon-juniper and sagebrush communities although some level of treatment would occur in all vegetation types. Treatment activities would occur within those areas identified for treatment in Section 2.5.5, Vegetation. Potential effects on special status species from restoration activities (i.e., removal or thinning of woodland and shrubland) would result in the incremental long-term reduction of dense woody vegetation states to achieve desired range of conditions for vegetation communities (see Section 2.5.5, Vegetation). However, these impacts would have only minor impacts on special status species. In the short term (less than 5 years), localized restoration activities would benefit special status species by increasing quantity and quality of herbaceous forage and ground cover, and improve breeding and seasonal habitats for wildlife in the long term (greater than 50 years). However, the levels of treatment within various vegetation communities under this alternative are not expected to keep up with the ongoing decline of ecological health in these same communities. Thus, vegetation communities would continue to exhibit transitions that affect wildlife habitat (e.g., aspen to conifer and establishment of pinyon and juniper trees in sagebrush shrubland), increased tree density and canopy cover, and a reduction of native herbaceous understory (e.g., grasses and forbs) in untreated areas. Although localized restoration activities to achieve the desired range of conditions would generally improve habitats for special status species in these areas, habitat quality would continue to decline at the landscape scale with associated increase in the risk for additional listings under the Endangered Species Act.

Management of the Mojave Desert ecological system would focus on maintaining or improving vegetation health and resiliency through management of various uses (e.g., livestock grazing, recreation, and wild horse herds) and the localized treatment of noxious weeds and exotic woody species (e.g., red brome and tamarisk). Although localized restoration activities would benefit special status species by increasing herbaceous forage and ground cover in the short term, and improving vegetation composition and structure in the long term, the levels of treatment under this alternative are not expected to keep pace with the ongoing spread of invasive species. Thus, landscape level effects would continue to result in increased habitat degradation and a reduction in overall habitat quality in the long term.

*Wild Horses.* Special status species conflicts with wild horses would include localized trampling and foraging activities over a large geographic area consisting of approximately 5.36 million acres of habitat in the long term. These effects would be most apparent within the limited riparian and wetland habitats that occur within designated herd management areas.



*Lands and Realty.* Under this alternative, approximately 28,531 acres of land would be available for possible land disposal. Potential land disposals would be evaluated for effects on special status species and their habitat on a case-by-case basis, in accordance with NEPA.

Under Alternative A, no additional utility corridors would be designated within the District and new utilities and communication sites would be encouraged to co-locate with existing facilities. Linear and communication projects that would be co-located with existing facilities would continue to result in increased habitat degradation and fragmentation in the long term. Development of newly proposed utility projects and communication sites would be evaluated for effects on special status species on a case-by-case basis, in accordance with NEPA. Implementation of requirements that would reduce potential impacts to special status species are presented in Appendix N.

Land use authorizations would be expected to result in the long-term reduction of habitat and increased effects from habitat fragmentation. Short-term impacts would result from increased noise and human presence. Under this alternative, species would benefit from the avoidance of additional land use authorizations within portions of ACECs (see Section 2.5.12, Lands and Realty). New land use authorizations would be evaluated for effects on special status species and their habitats on a case-by-case basis, in accordance with NEPA.

*Renewable Energy.* No specific areas would be designated for renewable energy (e.g., wind, solar, biomass). Conflicts from renewable energy development would likely have localized effects to special status species and their habitats. Long-term impacts would result from habitat loss and increased habitat fragmentation until reclamation is completed and native vegetation has become reestablished. Short-term impacts would result from increased noise and human presence. Effects to special status species would include habitat disturbance and added effects from habitat fragmentation (e.g., increased noise and human presence). These effects are anticipated to occur incrementally over time and at scattered locations over a large geographic area within the Ely District. Potential impacts would include limited mortalities of smaller, less mobile species, such as small mammals and reptiles, and the displacement of more mobile species into adjacent habitats. In areas where potential development intersects or approaches important species habitat (e.g., sage grouse breeding areas), resulting effects may require specific mitigation measures to minimize potential impacts. Development of renewable energy would be evaluated for effects on special status species and their habitats on a case-by-case basis, in accordance with NEPA. Implementation of best management practices that would reduce potential impacts to special status species are presented in Appendix B.

*Travel Management and Off-highway Vehicle Use and Recreation.* Under this alternative, approximately 9.8 million acres within the District would be open to cross-country off-highway vehicle use, while approximately 804,000 acres would be restricted to designated roads and trails. Approximately 760,000 acres would be closed to off-highway vehicle use. In addition, approximately 750,000 acres would continue to be managed as a special recreation management area. Development of roads and trails within the District would be expected to result in the incremental long-term loss of habitat and increased habitat fragmentation. Short-term impacts to special status species would result from increased noise and human presence. The greatest effects from these management programs would occur from activities that intersect



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or approach important species habitat (e.g., sage grouse breeding areas). Development of new roads and trails within the District would be evaluated for effects on special status species and their habitat on a case-by-case basis, in accordance with NEPA. Implementation of standard operating procedures and best management practices that would reduce potential impacts to special status species are presented in Appendices H, I, J, and K.

*Livestock Grazing.* Special status species conflicts with livestock grazing could continue to result from competition for forage, cover, and water resources in isolated situations throughout the District. On a landscape scale, livestock grazing would continue to affect habitat quality for special status species and, in some cases, may limit such populations.

Competition between desert bighorn sheep and livestock would continue for forage, cover, and water resources within occupied ranges (approximately 926,000 acres) and migration corridors (approximately 146,000 acres), and could limit the expansion of the species into historic ranges. On a landscape level, effects to bighorn sheep habitat would continue to result in long-term effects from habitat degradation and added fragmentation effects from restrictive barriers that limit migration between seasonal habitats and other populations. However, up to approximately 768,000 acres of desert bighorn habitats would likely be improved through the Revised Guidelines for Management of Domestic Sheep and Goats in Native Wild Sheep Habitats (Instructional Memorandum No-98-140), if implemented.

*Woodland and Native Plant Products.* Management of woodland and native plant products uses would result in only minor effects from the incremental long-term loss of pinyon-juniper trees and mountain mahogany and short-term seasonal increases in noise and human presence. Implementation of standard operating procedures and best management practices would reduce potential impacts to special status species.

*Mineral Extraction.* Mineral development activities would likely have localized effects on special status species and their habitats. Under Alternative A, long-term impacts to special status species would result from the disturbance of approximately 15,600 acres of potential habitat and the added effects from habitat fragmentation in association with oil and gas, geothermal, and metallic and industrial materials development. Short-term impacts would result from increased noise and human presence. These effects are anticipated to occur incrementally over the life of the plan and spatially over a large geographic area within the Ely District. Potential impacts could include limited mortalities of smaller, less mobile species (e.g., small mammals, reptiles, and invertebrates) and the displacement of more mobile species into adjacent habitats. Mineral development would be evaluated for effects on special status species and their habitat on a case-by-case basis, in accordance with NEPA. Terms and conditions that would reduce potential impacts to special status species and their habitats are presented in Appendix L.

*Watershed Management.* Watershed management activities, including vegetation treatments, would continue at near current levels in the future. These restoration treatments would affect special status species populations until desired vegetation becomes established (see Section 2.5.5, Vegetation). Actions designed to enhance habitat for special status species would, at times, be determined and designed outside of the watershed analysis process but would remain a part of watershed analysis. Following vegetation



treatments, the quantity and quality of forage (i.e., herbaceous vegetation) is expected to increase within treated areas and would provide improved habitat for wildlife in the short-term. In the Schell Resource area, the reservation of 30 percent of the additional forage for wildlife would provide an incremental increase in available forage for wildlife species. Additional forage within the Egan and Caliente Resource Areas on the District would continue to be allocated or reserved proportionately among all users, including wildlife, on a case-by-case basis. Although treated areas would provide additional herbaceous forage and increased habitat quality for wildlife on a localized basis, landscape level effects would continue to result from habitat degradation and fragmentation, and reduction in ecological health and vegetation resiliency in the long term.

*Fire Management.* Restoration activities resulting from managed natural wildfire and prescribed fire would commonly improve forage palatability for some special status species through the use of both native and nonnative plant species, increased availability of herbaceous forage plants, and increased amount of habitat edge in the short term. However, at the historic rate of restoration, it is anticipated that vegetation communities would continue to exhibit transitions in community structure and composition, increased tree density and canopy cover, and a reduction of native herbaceous understory (e.g., grasses and forbs) in untreated areas. In the absence of large fires, these habitat changes would result in a reduction of herbaceous forage, structure, and overall suitability of habitats for special status species. Even with the expansion of fire use to the extent allowed under the current fire plan, it is expected that woody fuels would continue to accumulate in untreated areas, and the probability of major, uncontrollable stand replacing fires would continue to escalate. Thus, over the long term, it is anticipated that increased large fire events would provide open niches for expansion of nonnative and functionally divergent weedy species including flammable annuals and non-palatable perennials. On a landscape scale, habitats would exhibit a reduction in overall habitat quality, ecological health, and vegetation resiliency in the long term.

*Noxious and Invasive Weed Management.* Management of invasive and noxious weeds may cause some temporary and localized impacts to special status species as a result of weed eradication techniques (i.e., use of herbicide) within the District. With proper application of approved herbicides, impacts to species would not be expected to cause population level effects. Standard operating procedures developed to reduce potential impacts with special status species are presented in Appendix H. Treatments designed to decrease or eliminate noxious weeds would benefit special status species habitats by reducing or eliminating the chances for dominance of plant species with limited forage or cover values.

**Conclusion.** Management of special status species would continue to occur predominantly at the scale of individual allotments and occasionally at a District-wide scale through management actions that address an immediate need or habitat niche for the maintenance, mitigation, and restoration of a single special status species on a case-by-case basis. Although restoration would promote more suitable habitat conditions for special status species on a localized basis, watershed level and landscape level effects would include continued habitat deterioration for many of the special status species.

## **Alternative B**

**Impacts from Special Status Species Management Direction.** Under this alternative, habitat requirements, trends, threats, and management objectives for special status species would be reviewed at



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the broad national and regional scales. Special status species would be specifically assessed, based on species-specific desired future conditions, and compared to overall habitat conditions and identification of causal factors for declines at the District scale, and proactively resolved through habitat restoration and multiple use restrictions or modifications at the watershed scale. Maintenance and mitigation measures would continue to be implemented where multiple-use impacts occur or where habitat or populations are at or near their natural potential. As a result, implementation of this alternative would establish management criteria through desired future conditions of special status species in order to treat and restore imperiled vegetation communities within the District and ensure that special status species are factored into the decision-making process during restoration actions.

Under this alternative, important roosting and foraging habitats for bats would be identified independent of the watershed analysis and proactive measures would be implemented to conserve, protect, and restore these habitats. In order to protect sensitive bat roost areas (e.g., hibernaculum, maternity roost, bachelor roosts) from recreational caving, the Ely District Cave Management Plan would be updated, as needed, to account for known roost sites. On a watershed level, implementation of this alternative would improve roosting and foraging habitat for bat species. On a landscape level, vegetation restoration activities to achieve the desired ranges of vegetation conditions would benefit sensitive bat species by reducing habitat degradation and fragmentation, and promoting ecological health and vegetation resiliency.

Within riparian habitats of the Mojave Desert and Great Basin ecological systems, the Rainbow, Carp, and Rox portions of the Lower Meadow Valley Wash would be designated as the Lower Meadow Valley Wash ACEC. Under this alternative, livestock grazing would be excluded in the Rox and Carp ACEC units within the Lower Meadow Valley Wash to protect and initiate conservation and restoration of the terrestrial and aquatic resources of the riparian corridor. Implementation of this alternative would result in increased nesting and foraging habitat for riparian special status species (e.g., southwestern willow flycatcher and yellow-billed cuckoo, Arizona southwestern toad). Proper management of riparian areas also would benefit a wide variety of special status species including fish and springsnails.

Within desert scrub habitats of the Mojave Desert ecological system, livestock grazing would be excluded from the remaining desert tortoise habitat to protect and conserve Mojave Desert special status species (see **Map 2.4-40**, Livestock Closure Area Alternative B). Implementation of this alternative would increase herbaceous forage, cover, and shrub structure for special status species (e.g., desert tortoise, banded gila monster) in the Mojave Desert ecological system. Additional restoration and management actions and mitigation measures to protect or enhance habitats would be evaluated during the watershed analysis and habitat analyses.

Desert bighorn sheep would be managed in all historic ranges and in all historic seasonal habitats. Domestic livestock (sheep and cattle) grazing would be eliminated in all desert bighorn sheep ranges and migration routes. Implementation of restoration and management actions would promote increased shrub, browse, and forb forage production; escape and thermal cover; and improved breeding and seasonal habitats for desert bighorn sheep and other special species that occur within similar habitats. In addition, removal of restrictive barriers and removal of conflicting uses (i.e., livestock grazing) in all high elevation



summer habitat, low elevation winter habitat, historic habitats, and historic and potential range and migration corridors would improve overall habitat quality and distribution of desert bighorn sheep on the District.

Within desert scrub and salt desert shrub habitats, systematic breeding surveys would be conducted in all potential western burrowing owl habitats, and a habitat assessment describing the conditions of occupied and unoccupied habitats would be documented. Under this alternative, habitat degradation and fragmentation within suitable breeding burrowing owl habitat would likely continue during the short term. However, on a long-term landscape scale, restoration activities to achieve appropriate ranges of vegetation conditions would benefit special status species by reducing habitat degradation and fragmentation, and promoting ecological health and resiliency.

Within sagebrush habitats of the Great Basin ecological system, a balanced multiple species approach to greater sage-grouse management would be taken in conjunction with all other BLM sensitive species needs, priorities, goals, and objectives.

Livestock management would be adjusted to maintain quality habitats if livestock are determined to be a causal factor for nonattainment of standards through mid-scale sage grouse habitat assessments in sagebrush communities. On a watershed level, implementation of this alternative would increase herbaceous forage, cover, and shrub structure for sagebrush-dependent special status species (e.g., sage grouse, pygmy rabbit). On a landscape level, restoration activities to achieve appropriate ranges of vegetation conditions would benefit special status species by reducing habitat degradation and fragmentation, and promoting ecological health and resiliency.

**Impacts from Other Programs.** Effects to special status species associated with mineral extraction and invasive and nonnative plant species would be the same as described for Alternative A. The following interrelated programs would result in different effects as compared to Alternative A.

*Vegetation.* Alternative B would involve a substantially greater level of vegetation treatment and different management approaches than Alternative A. The overall approach of this alternative is oriented toward proactive habitat restoration to achieve the desired range of vegetation conditions described in Section 2.5.5, Vegetation. Although treatment and maintenance activities would occur over the full spectrum of vegetation communities, the majority of the overall area to be treated occurs within the low-elevation sagebrush and pinyon-juniper vegetation communities. Limited areas of treatment also would occur in other vegetation communities where current conditions are not within the desired range of conditions, with particular emphasis in riparian and aspen communities.

Impacts to wildlife (including special status species) from vegetation management under Alternative B would include the long-term loss of woody vegetation (i.e., trees, woodlands, and shrubs) and the temporary loss of forage and cover in the areas being treated until the desirable perennial species become reestablished. Application of the Sage Grouse Best Management Practices (Appendix K) and adherence to Guidelines for Management of Sage Grouse Populations and Habitats (Connelly et al. 2000) would limit the extent and severity of these impacts within sage grouse habitats. It is anticipated that treated areas would result in increased herbaceous forage and ground cover in the short term, followed by the establishment of shrub



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vegetation in the long term that meet the desired range of conditions. On a watershed level, restoration activities would result in higher quality forage, increased vegetation cover and structure, and improved breeding and seasonal habitats for wildlife species. On a landscape level, restoration and habitat management would benefit special status species by reducing habitat degradation and fragmentation, promoting ecological health and vegetation resiliency, and improving overall habitat quality.

*Wild Horses.* Wild horse management would have the same general effects on special status species as described under Alternative A except that conflicts with wild horses would be reduced as a result of a reduction in herd management areas (by approximately 1.76 million acres) and reduction in total wild horse populations on the District. Under this alternative, some special status species (e.g., desert tortoise and banded gila monster) would see increasing herbaceous forage and water availability, particularly within the Mojave Desert ecological system.

*Lands and Realty.* Under Alternative B, 87,834 acres of land would be available for possible land disposal. Potential land disposals would be evaluated for effects on special status species and their habitat on a case-by-case basis, in accordance with NEPA.

Specific types of linear projects would be required to co-locate within designated corridors, and new communication sites only would be developed after existing sites have reached capacity. Under this alternative, new 0.5-mile wide utility corridors would be designated within the District. Potential effects to special status species would include the incremental long-term disturbance of habitat and added effects from habitat fragmentation. Short-term impacts would result from increased noise and human presence. These effects are anticipated to occur incrementally over time and spatially over a large geographic area within the Ely District. Potential impacts would include limited mortalities of smaller, less mobile species (e.g., small mammals and reptiles) and the displacement of more mobile species into adjacent habitats. In areas where potential development intersects or approaches important habitat (e.g., sage grouse breeding areas), resulting effects may require specific mitigation measures to minimize potential impacts. For example, the proposed utility corridor along the eastern margin of Spring Valley passes within 2 miles (on either side of the 0.5-mile-wide corridor) of the 11 known sage grouse leks (see **Map 2.4-22**). Requirements that have been developed to reduce or prevent potential impacts to special status species and their habitats from utility corridors are presented in Appendix N. Development of utility projects and communication sites would be evaluated for effects on special status species and their habitat and mitigated as needed, on a case-by-case basis, in accordance with NEPA.

Implementation of Alternative B would result in fewer special status species conflicts from land use authorizations as compared to Alternative A. Under this alternative, land use authorization facilities would be located and consolidated within or adjacent to existing land use authorizations, where feasible, thus minimizing overall affects to species. Development of new land use authorization facilities would be evaluated for effects on special status species and their habitat on a case-by-case basis, in accordance with NEPA.

*Renewable Energy.* Conflicts to special status species and habitats would be the same as discussed for Alternative A except that approximately 201,000 acres of the District would be designated for wind



energy and approximately 6.8 million acres would be designated as solar energy development areas. Renewable energy development would not be restricted to these areas and would produce effects similar to those discussed for Alternative A.

*Travel Management and Off-highway Vehicle Use and Recreation.* Travel management and off-highway vehicle use and recreation management activities would have the same general effects on special status species as described under Alternative A, except no cross-country off-highway vehicle use would be permitted. Approximately 1.1 million acres would be closed to off-highway vehicle use and approximately 10.3 million acres would be restricted to existing roads and trails. Under this alternative, approximately 2.7 million acres would be managed as nine dispersed special recreation management areas. Two new recreation permit areas totaling 656,000 acres also would be established for motorcycle special recreation events. These actions would concentrate habitat degradation, habitat fragmentation, off-highway vehicle noise generations and human presence in a smaller area than Alternative A. Development of new roads and trails within the District would be evaluated for effects on special status species and their habitat on a case-by-case basis, in accordance with NEPA. Implementation of standard operating procedures and best management practices that would reduce potential impacts to wildlife are presented in Appendices H, I, J, and K.

*Livestock Grazing.* Effects to special status species from livestock grazing would be reduced from those described for Alternative A since there would be approximately 3.6 million fewer acres available for livestock grazing with closure of grazing in desert tortoise habitat and bighorn sheep habitat. These potential closures are shown on **Map 2.4-40**. In addition, approximately 25,700 acres of additional ACECs would be closed to grazing. Implementation of this alternative would be expected to incrementally increase herbaceous forage and water availability.

Under this alternative, domestic livestock (sheep and cattle) would be eliminated in approximately 768,000 acres of occupied and historic desert bighorn sheep ranges and migration routes. As a result, conflicts between bighorn sheep and livestock within occupied and historic ranges would be greatly reduced and would be expected to result in increased herbaceous forage and water availability, followed by improved habitat quality, expansion into unoccupied ranges, and improved overall health of bighorn sheep populations in the long term.

*Woodland and Native Plant Products.* Effects to special status species from management of woodland and native plant products would be similar to those described for Alternative A, except that woodland product management would include the collection of a greater variety of woody species (i.e., pinyon-juniper trees, mountain mahogany, Gambel's oak, aspen, ponderosa pine, white fir, and spruce) in areas for personal and commercial use.

*Watershed Management.* After Standards for Rangeland Health have been met at the watershed level, additional forage would be reserved for wildlife. Implementation of this alternative would provide a net increase in available forage, cover, and overall habitat quality for special status species in the long term.



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*Fire Management.* Fire management under Alternative B would involve fire use to the greatest extent practical in implementing vegetation treatments. Because of its cost effectiveness, the fire management approach would facilitate treatment and restoration over greater areas as compared to Alternative A. In the short term, it is anticipated that treatment areas would result in increased herbaceous forage and ground cover for special status species, followed by improved shrubland habitat conditions (e.g., structure) in the long term. On a landscape level, restoration and habitat management would benefit wildlife by promoting ecological health and vegetation resiliency, and improving overall habitat quality. Return to historical fire regimes and condition classes would reduce impacts to special status species when fires occur.

**Conclusion.** Special status species would be specifically assessed, based on species-specific desired future conditions, and compared to overall habitat conditions and identification of causal factors for declines at the mid-scale. On a watershed level, restoration activities would result in higher quality forage, increased cover and vegetation structure, and increased security for special status species. On a landscape level, restoration activities to achieve desired range of conditions would improve special status species habitats by reducing habitat degradation and fragmentation, and promoting ecological health and resiliency.

### Alternative C

**Impacts from Special Status Species Management Direction.** Under this alternative, management of special status species would be similar to Alternative A. Special status species management would continue to occur predominantly at a fine-scale and occasionally at a large-scale through management actions that address an immediate need or habitat niche for the maintenance, mitigation, and restoration of a single special status species on a case-by-case basis. While management actions would be taken as necessary to prevent the listing of additional species in accordance with BLM Management Policy 6840, the desired range of vegetation conditions used under this alternative would be less favorable for most special status species than those used in Alternative B.

Under this alternative, management of bat roosting and foraging habitat would be the same as described for Alternative B, except restoration actions for bats would be emphasized only in areas where there are no conflicts with commodity objectives. However, the Ely District Cave Management Plan would be updated to further expand recreational caving opportunities and minimize and mitigate impacts to bat roosts from caving. As result, potential conflicts to foraging and roosting habitat outside of cave habitats would continue to result in landscape level effects from increased habitat degradation and habitat fragmentation.

Within riparian habitats of the Mojave Desert and Great Basin ecological systems, restoration activities within Meadow Valley Wash would be similar to Alternative A, except that the Lower Meadow Valley Wash ACEC would be managed based on multiple-use objectives for increased forage production and developed and managed recreation. Under this alternative, baseline livestock utilization levels, special use restrictions, and season of use designations would not be enacted unless livestock were determined through watershed analysis to be a causal factor for nonattainment of standards and guidelines, and utilization and special use restrictions would be enacted as needed. As a result, grazing and recreation would continue to affect herbaceous and shrub cover and overall nesting and foraging structure for riparian habitat dependent



special status species (e.g., southwestern willow flycatcher, yellow-billed cuckoo, Arizona southwestern toad).

Management of special status species (desert tortoise, banded gila monster) within desert scrub habitats of the Mojave Desert ecological system would be the same as described for Alternative A and similar impacts would be expected.

Within Mojave Desert mountain and desert scrub habitats, management of desert bighorn sheep would be similar to Alternative A. As a result, long-term degradation of desert bighorn sheep habitat would continue to occur. Restrictive barriers that limit migration between seasonal habitats and other populations would remain. However, habitat quality for this species would likely be improved through the Revised Guidelines for Management of Domestic Sheep and Goats in Native Wild Sheep Habitats (Instructional Memorandum No-98-140), if implemented.

Management of special status species (western burrowing owl) within desert scrub and salt desert shrub habitats of the Mojave Desert and Great Basin ecological systems would be the same as described for Alternative A and similar impacts would be expected.

Management of greater sage-grouse habitat would be similar to Alternative A, except that sagebrush habitat restoration would be emphasized in areas that have the greatest potential to provide additional livestock forage, while stabilizing sage grouse populations. As described for Alternative A, there are no current long-term management actions identified for sage grouse habitat management. Long-term management actions for sage grouse would be implemented through future recommendations from the local sage grouse planning teams or through actions identified through watershed analysis. As a result, effects to sagebrush habitat that would not be actively managed for sage grouse and would continue to result in habitat degradation and fragmentation.

**Impacts from Other Programs.** Under this alternative, effects to special status species associated with livestock grazing, woodland and native plant products, mineral extraction, and invasive and nonnative plant species would be similar to those described for Alternative A. Effects associated with wild horses and renewable energy would be the same as described for Alternative B. The following interrelated programs would result in different effects as compared to the previous alternatives.

*Vegetation.* Vegetation treatments in Alternative C would focus on similar areas but somewhat greater total acreage to be treated as under Alternative B, but the treatment and management approach would focus treatments on the creation of vegetation communities that are more productive for commodity interests such as livestock and elk. Under this alternative, restoration treatments would increase herbaceous vegetation states and reduce the amount of mature woodland and shrub states, as compared to other alternatives. Thus, achievement of successful restoration would generally benefit a somewhat different set of special status species (i.e., grassland-dependent species) under this alternative than under Alternative B. Like Alternative B, the treatments would be heavily oriented toward sagebrush and pinyon-juniper communities with limited applications in other communities where current conditions are not within the desired ranges of vegetation conditions.



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Impacts to special status species from vegetation management under Alternative C would include the short-term reduction in forage and ground cover on each treatment area until the desirable perennial species recover or become established, and the long-term conversion from dense shrub and woodland communities to open, herbaceous-dominated communities on much of the treated area. While this conversion would favor some special status species by creating a greater amount of herbaceous forage and ground cover, a reduction of more mature and dense shrub vegetation would result in the long-term reduction of breeding and seasonal habitats for shrubland-dependent species. On a landscape scale, a reduction in overall habitat quality would occur in the long term for those special status species that rely on large expanses of dense sagebrush.

*Lands and Realty.* Conflicts to special status species from potential disposal of lands would be the same as described for Alternative B except that up to 288,744 acres would be available for possible disposal. Conflicts with utility corridor management would result in the same general effects as described under Alternative B, except that existing designated corridors would be increased to 3 miles in width, resulting in greater fragmentation effects. In this alternative, the proposed utility corridor along the western margin of Spring Valley would potentially affect 36 sage grouse leks (within 2 miles on either side of the 3-mile-wide corridor [see **Map 2.4-23**]). Potential conflicts with the development of communications sites would be the same as described for Alternative B.

Land use authorizations would likely result in increased habitat degradation and fragmentation on special status species in the long term. New land use authorizations would be evaluated for effects on special status species, in accordance with NEPA. Implementation of requirements that would reduce potential impacts to special status species are presented in Appendix N.

*Travel Management and Off-highway Vehicle Use and Recreation.* Conflicts from travel management and off-highway vehicle use and recreation would be the same as described for Alternative A, except that cross-country off-highway vehicle use would be limited to approximately 32,000 acres. Approximately 760,000 acres would be closed to off-highway vehicle use and approximately 10.6 million acres would be restricted to existing roads and trails. In addition, 3.3 million acres would be managed as nine dispersed special recreation management areas in the District. Four new recreation permit areas totaling 1.36 million acres also would be established for motorcycle special recreation events. As a result, degradation of habitat and habitat fragmentation associated with these uses would occur on a larger area than under Alternative B but a more concentrated area than Alternative A.

*Watershed Management.* After Standards for Rangeland Health have been met at the watershed level, additional forage would be allocated to livestock rather than being reserved for wildlife species. As increasing portions of the District are restored to resilient conditions with greater herbaceous productivity, this approach could result in authorizations for increased livestock usage on treated watersheds. Increased livestock stocking rates would correspondingly result in increased conflicts with special status species.

*Fire Management.* Under Alternative C, prescribed fire and managed natural fire would not be preferred management tools and wildland fires would be suppressed to the extent practical. Although areas



treated would be greater than described for Alternative A, it is anticipated that increased fuel loading from full fire suppression on the District would eventually lead to large fire events that would result in conversion of large blocks of wildlife habitat to herbaceous perennial communities or possibly even herbaceous communities dominated by invasive annual weedy species.

**Conclusion.** Management of special status species would continue to address an immediate need or habitat niche for the maintenance, mitigation, and restoration of a single special status species on a case-by-case basis. On a watershed level, special status species conflicts would include decreased shrub cover, a reduction in vegetation community structure, and increased competition for habitat by sagebrush dependent species.

### **Alternative D**

**Impacts from Special Status Species Management Direction.** Under this alternative, management of special status species would emphasize a passive management approach to restoration through the exclusion of discretionary uses of public lands to achieve the desired range of conditions. Natural processes would be allowed to restore degraded habitats and determine future habitat conditions. Any active habitat management would emphasize restoration of direct human-induced alterations to the natural environment and protection of large, core areas of existing intact habitats.

Effects to special status bat species under this alternative would be the same as described for Alternative A and similar impact would be expected.

Within riparian habitats, implementation of this alternative would result in the incremental increase in nesting and foraging habitat for riparian special status species (e.g., southwestern willow flycatcher, yellow-billed cuckoo, Arizona southwestern toad).

Within desert scrub habitats of the Mojave Desert ecological system, this alternative would benefit Mojave Desert special status species (e.g., desert tortoise, banded gila monster) by improving herbaceous understory and cover in the long term.

Within Mojave Desert mountain and desert scrub habitats, landscape level changes would continue to result in habitat degradation, reduction in ecological health and resiliency, and reduction in overall biological diversity largely as a result of the potential spread of invasive species.

Within desert scrub and salt desert shrub habitats of the Mojave Desert and Great Basin ecological systems, western burrowing owl habitats would be favored by localized restoration activities that would improve habitat conditions for special status species. Landscape level changes would continue to result in habitat degradation, reduction in ecological health and resiliency, and reduction in overall biological diversity largely as a result of the potential spread of invasive species.

Within sagebrush habitats of the Great Basin ecological system, no BLM Sensitive Species goals would be of a higher profile or prioritized over other BLM Sensitive Species goals.



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**Impacts from Other Programs.** Under this alternative, effects to special status species associated with mineral extraction and invasive and nonnative plant species would be the same as described for Alternative A. The following interrelated programs would result in different effects as compared to the previous alternatives.

*Vegetation.* Management of vegetation would emphasize a passive management approach to restoration with minimal influence from management and resource uses. As a result, degraded and fragmented habitats would be restored primarily through natural processes over the long term. Active habitat management would emphasize habitat treatments of invasive vegetation species. Implementation of this alternative would result in the continuation of natural habitat transitions in vegetation community structure and composition. In the absence of large fires, these habitat changes would result in continued growth and maturation of immature shrubs and trees, increased canopy cover, and decreased abundance of understory herbaceous species.

*Wild Horses.* Under this alternative wild horse populations would not be managed or controlled within the existing 24 herd management areas discussed for Alternative A. Thus, severe conflicts to special status species on approximately 5.36 million acres of habitat would result from increased resource competition (e.g., water and forage), a reduction of herbaceous forage and ground cover, a reduction in habitat structure, and a long-term reduction in overall habitat quality.

*Lands and Realty.* Conflicts to special status species and habitats would be less than those discussed for Alternative A because no net loss of habitat would occur under this alternative, nor would any new land use authorizations take place.

*Renewable Energy.* There would be no impacts from renewable energy because there would be no new land use authorizations under Alternative D.

*Travel Management and Off-highway Vehicle Use and Recreation.* Under this alternative, off-highway vehicle use would be restricted to approximately 400,000 acres of designated roads and trails. This closure of approximately 11 million acres to off-highway vehicle use would greatly reduce the effect to special status species by reducing overall habitat degradation and fragmentation.

*Woodland and Native Plant Products.* Conflicts to special status species from woodland and native plant products would be minimal since only limited pinyon pine nut harvesting would be permitted.

*Livestock Grazing.* No conflicts to special status species from livestock management would occur under this alternative since livestock use would not be permitted on the District. This aspect of Alternative D would result in higher habitat quality for special status species, at least in the short term.

*Watershed Management.* Additional available forage would be allocated for watershed maintenance, wildlife, and wild horses after Standards for Rangeland Health have been met at the watershed level. However, because active management would not be a priority under this alternative, watershed level



impacts would continue to result in habitat transitions and increased canopy cover. Landscape level impacts would continue to result in a reduction in overall habitat quality, ecosystem health, and ecological resiliency in the long term, largely as the result of increased probability for large fires followed by reduced success probabilities for rehabilitation.

***Fire Management.*** Implementation of this alternative with minimal fire suppression, limited vegetation treatments, and absence of livestock grazing would result in accumulation of fire fuels in sagebrush and heavy fuels in shrublands and woodlands. This would ultimately lead to fire events that would have a high likelihood of eliminating shrub cover and woodland habitats for special status species in the long term. These impacts would be expected to occur at a large geographic scale with substantial cover losses, especially at lower elevations. Depending on shrub and woodland overstory, recovery rates, fire frequency, and reclamation success, these events could result in short- and long-term impacts. Effects would include long-term diminished habitat productivity and diversity for entire communities of shrubland and woodland wildlife. In the event of unsuccessful fire rehabilitation, these areas could devolve into vast monocultures of herbaceous grasslands dominated by cheatgrass and other invasive species that are of little or no value to special status species.

**Conclusion.** Management of special status species would emphasize a passive management approach through the exclusion of discretionary commodity uses of public lands. On a watershed level, natural habitat transitions would continue with increased canopy cover and possible increased regeneration of palatable species. On a landscape level, habitats would exhibit a reduction in overall habitat quality, ecological health, and resiliency as the result of major, widespread wildfires resulting in conversion to herbaceous communities. These habitat changes would result in a reduction of vegetation community structure and overall suitability of habitats for special status species.

### Alternative E

**Impacts from Special Status Species Management Direction.** Management and conflicts to special status species would be similar to Alternative B except as noted below. As a result, implementation of this alternative would establish management criteria through desired future conditions of special status species to promote and restore imperiled vegetation communities within the District and ensure that special status species are factored into the decision making process during restoration actions.

Under this alternative, recreational caving would be reassessed for impacts and the Ely District Cave Management Plan updated. The Nevada Bat Conservation Plan would be utilized for guidance on implementation of proactive bat management actions and the size and spatial arrangement of other restoration actions in vegetation communities, especially riparian areas and pinyon and juniper woodlands, would consider the habitat needs of obligate bat species. On a watershed level, implementation of this alternative would improve roosting and foraging habitat for bat species. On a landscape level, restoration activities to achieve desired range of conditions for vegetation communities would benefit sensitive bat species by reducing habitat degradation and fragmentation, and promoting ecological health and vegetation resiliency. Bats would be considered in relation to the planned closure of any mine shafts, tunnels, or similar features.



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Within the northern portion of the Lower Meadow Valley Wash, grazing would be restructured to protect habitat for the southwestern willow flycatcher. This would provide additional protection beyond the Lower Meadow Valley Wash ACEC. On a watershed level, this alternative would result in increased nesting and foraging habitat for riparian special status species. On a landscape level, restoration activities to achieve desired range of conditions for vegetation communities would benefit special status species by reducing habitat degradation and fragmentation, and promoting ecological health and vegetation resiliency.

Management of special status species (desert tortoise, banded gila monster) within desert scrub habitats of the Mojave Desert ecological system would be the same as described for Alternative B, except that livestock grazing would be excluded from the desert tortoise ACECs and managed with special use restrictions within non-ACEC desert tortoise habitats. On a watershed level, special status species in the Mojave Desert ecological system would continue to benefit from the exclusion of livestock grazing within designated desert tortoise ACECs and special use restrictions that have been developed for non-ACEC desert tortoise. This management direction would provide higher quality forage (i.e., grasses and forbs) and cover within these areas. On a landscape level, restoration activities to achieve desired range of conditions for vegetation communities would benefit special status species by reducing habitat degradation and fragmentation, and promoting ecological health and vegetation resiliency.

Management of desert bighorn sheep within mountains and desert scrub habitats

of the Mojave Desert ecological system would be similar to Alternative A, except that no domestic sheep or goat grazing would be allowed within 9 miles of desert bighorn sheep habitat except where topographic features or other barriers prevent physical contact between desert bighorn sheep and domestic sheep or goats. High and low elevation habitat management would occur directly from active large-scale restoration and indirectly through wildfire emergency stabilization projects. On a watershed basis, implementation of restoration activities and habitat management would increase available forage and cover, structure, and breeding and seasonal habitats for special status species in the long term. On a landscape level, restoration and habitat management to achieve desired ranges of vegetation conditions would benefit special status species by reducing habitat degradation and fragmentation, and promoting ecological health and vegetation resiliency. In addition, removal of conflicting uses (i.e., sheep and goat use) within a 9-mile radius of desert

### ***RMP Management Focus***

***The restoration and maintenance of healthy ecological systems within watersheds is a primary focus for the future management of the Ely District. Healthy ecological systems are geographically diverse and change over time. They are compatible with soil potential and are resilient to disturbance.***

***Resources and resource uses will be managed to restore or maintain ecological health. Certain resource management changes and active treatments may need to be implemented, in portions of watersheds, to accomplish this objective. Adaptive management will be pursued to avoid deteriorating conditions favoring invasive plants and catastrophic fires. Any projects will be implemented so as to result in a mosaic of vegetation within a watershed.***

***In the long term, natural disturbance (such as drought or fire) will occur and fewer treatments will be needed to maintain ecological health. The result will be a variety of vegetation phases within a watershed, which will provide diverse, healthy conditions for future generations.***



bighorn sheep habitat (for a total of approximately 2.96 million acres) would improve overall habitat quality and distribution of desert bighorn sheep on the District.

Management of special status species (western burrowing owl) within desert scrub and salt desert shrub habitats of the Mojave Desert and Great Basin ecological systems would be the same as described for Alternative B and similar impacts would be expected.

Within sagebrush habitat of the Great Basin ecological system, management of greater sage-grouse habitat would be the same as Alternative B, except that sage grouse habitat needs would be utilized as a model for management in sagebrush communities. Sagebrush obligate BLM Sensitive Species would be considered in site-specific analysis. On a watershed level, implementation of this alternative would increase herbaceous forage, cover, and shrub structure for sagebrush-dependent special status species (e.g., sage grouse, pygmy rabbit). On a landscape level, restoration activities to achieve appropriate ranges of vegetation conditions would benefit special status species by reducing habitat degradation and fragmentation, and promoting ecological health and resiliency.

**Impacts from Other Programs.** Under this alternative, effects to special status species associated with mineral extraction and invasive and nonnative plant species would be the same as described for Alternative A. Effects to special status species associated with wild horses, renewable energy, woodland and native plant products, and fire management would be similar to those described for Alternative B. The following interrelated programs would result in different effects as compared to the previous alternatives.

*Vegetation.* Conflicts to special status species from the management of Great Basin ecological systems would be generally similar to those described for Alternative B. Conflicts to special status species from the management of Mojave Desert ecological system would be the same as described for Alternative A.

*Lands and Realty.* Conflicts to special status species from possible land disposals involve 95,677 acres identified for possible disposal. Potential land disposals would be evaluated for effects on special status species and their habitat, in accordance with NEPA.

*Travel Management and Off-highway Vehicle Use and Recreation.* Conflicts from travel management and off-highway vehicle use would be the same as described for Alternative B, except that approximately 734,000 acres would be identified for off-highway vehicle emphasis areas. In addition, approximately, 1.36 million acres would be established for motorcycle special recreation events. Development of new roads and trails and within the District would be evaluated for effects on special status species and their habitat on a case-by-case basis, in accordance with NEPA. Implementation of standard operating procedures and best management practices that would reduce potential impacts to special status species are presented in Appendices H, I, J, and K. As discussed for Alternative B, recreation management would result in the added potential disturbance (e.g., increased noise and human presence) of approximately 2.7 million acres of habitat under this alternative.



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*Livestock Grazing.* Special status species conflicts with livestock grazing would be the same as Alternative A except that potential desert bighorn sheep conflicts with livestock grazing would be reduced by excluding domestic sheep and goats within 9 miles from desert bighorn sheep habitat (approximately 770,600 acres). As a result, implementation of this alternative would result in increased population health and elimination of potential disease transfer to bighorn sheep. Long term effects would include desert bighorn sheep expansion into unoccupied ranges, improved overall health of desert bighorn sheep populations, and improved habitat quality.

*Watershed Management.* After standards for rangeland health have been met at the watershed level, special status species would benefit from additional quality forage that would be allocated to livestock and wild horses and reserved for watershed maintenance and wildlife in a balanced approach in the long term.

**Conclusion.** Special status species would be specifically assessed, based on species-specific desired future conditions, and compared to overall habitat conditions and identification of causal factors for declines. On a watershed level, restoration activities would result in higher quality forage, increased cover and vegetation structure, and increased habitat quality for special status species. On a landscape level, restoration activities to achieve appropriate ranges of vegetation conditions would improve special status species habitats by reducing habitat degradation and fragmentation, and promoting ecological health and resiliency.



## 4.8 Wild Horses

### Impact Issues

The primary impact issues associated with wild horse management relate to resource conflicts with other uses such as vegetation, watersheds, wildlife habitat, livestock grazing, and erosion prevention/soil stabilization when appropriate management levels are not achieved. In the absence of population controls, most horse herds have the capacity to grow beyond the ability of the habitat to provide food, water, and shelter. As herds grow beyond the appropriate management level for a given herd management area, the horses increasingly compete with both wildlife and livestock for those local resources. Thus, population controls such as periodic gathers or fertility vaccinations are typically necessary to stabilize populations at levels supported by the available resources and compatible with other ongoing land uses.

During the next several decades, the competition for resources among wild horses, livestock, and wildlife would likely increase in various portions of the District as a result of activities that disturb or remove vegetation, thus reducing the forage/habitat resource base for all three user groups. As discussed in more detail in the following text, these activities would include such things as vegetation treatment and restoration, mineral extraction, recreation and off-highway vehicle use, and possible land disposals. However, vegetation treatments would soon recover to provide additional forage and habitat.

### Assumptions for Analysis

- Appropriate management level would be achieved and maintained in all alternatives except Alternative D.
- Public attitudes toward wild horse protection and adoption would remain similar to those displayed over the past 10 to 20 years.
- Natural reproduction and recruitment rates would continue to exceed natural mortality from predation, disease, and other factors.

### Interactions with Other Programs

The wild horse management program within the Ely District potentially would be affected by actions within the resource management programs for water resources, vegetation, fish and wildlife, special status species, lands and realty, renewable energy, recreation, livestock grazing, geology and mineral extraction, watershed management, fire management, noxious and invasive weed management, and special designations.

**Goal – Maintain and manage healthy and genetically viable wild horses inside herd management areas within appropriate management levels to ensure a thriving natural ecological balance while preserving a multiple use relationship with other uses and resources.**



### Alternative A

**Impacts from Wild Horses Management Direction.** Under Alternative A, the 24 herd management areas presently existing within the Ely District would be retained with a collective area of approximately 5.36 million acres (see **Table 2.5-9** and **Map 2.4-2**). The Ely Field Office has recently completed an evaluation survey of habitat conditions on all of the herd management areas to determine whether or not each unit provided the five essential components of wild horse habitat and herd characteristics (water, forage, cover, space, and genetic viability). Where one or more of the components were missing, the herd management areas were determined to be unsuitable for year-round habitation by wild horses. If all the essential habitat components were present to maintain healthy, self-sustaining wild horse populations on either individual herd management areas or two or more adjacent herd management areas, monitoring data were used to establish appropriate management levels. Where forage availability within herd management areas and monitoring data for livestock allotments showed success in achieving allotment objectives, wild horse census records were examined to determine historical ranges of populations. When no range health issues were apparent, the upper value of that range was used to set appropriate management level. When allotment objectives were not being achieved, wild horse and livestock use were examined and considered and appropriate management levels were set based on census data relative to the level of range utilization. As indicated in **Table 2.5-9**, which shows the existing appropriate management levels before the recent reevaluation, both Cherry Creek and Meadow Valley Herd Management Areas have appropriate management levels of zero, while the existing appropriate management levels for Applewhite, Blue Nose Peak, and Rattlesnake Herd Management Areas are only one. Other herd management areas failing to meet the criteria even though they have appropriate management levels included Moriah, Jakes Wash, Seaman, Miller Flat, Little Mountain, Clover Creek, and Clover Mountains.

Alternative A would maintain the current 24 herd management areas on approximately 5.36 million acres, with an appropriate management level of 2,141 wild horses. As demonstrated by the recent evaluation survey, many of the current herd management areas lack one or more of the necessary habitat components to sustain their numbers on a year-long basis. Especially in the south end of the Ely District, where quality forage is limited and water sources are scarce, herds would be in jeopardy from starvation or dehydration. When herd size grows beyond appropriate management level, such hazards to health and well-being would be intensified during periods of drought. At the same time, the wild horse herds could cause substantial, harmful effects on vegetation resources on both public and private lands. Small (non-viable) herds existing in these herd management areas may be extirpated by natural means.

Under Alternative A, some herds would continue to be managed with appropriate management levels as a fixed number until another analysis of appropriate management level has been completed and other herds with appropriate management levels as a range, depending upon the existing decision applicable for each herd. For herd management areas with an appropriate management level established as a single number, gathers would be conducted when that number is exceeded to bring populations to far enough below the appropriate management level to allow for natural population growth over a 3- to 4-year period before the next gather. For herd management areas with an appropriate management level set as a range, the wild horse population would be managed within that range.



This alternative produces no direct changes in the horse herds or in their habitat. Small herds would continue to be vulnerable to starvation and dehydration during drought years in those herd management areas where population numbers substantially exceed the appropriate management level.

Boundary fences along the perimeter of herd management areas would only be constructed where livestock grazing allotment boundaries coincide with herd management area boundaries. Thus, herd movements generally would not be restricted within the herd management areas and conflicts with other resource uses would continue to be largely addressed on a case-by-case basis.

Wild horses would be managed where herd management areas currently exist regardless of whether habitat conditions can support a long-term genetically viable population or not. The maintenance of small herds tends to reduce genetic diversity within these populations over several generations and render them more susceptible to various diseases and other maladies.

#### **Impacts from Other Programs.**

*Water Resources.* Water is a limiting factor for horse herds on several herd management areas within the District, affecting not only the basic survival of horses within these areas, but also the distribution of their use and degree of conflict with other animals, including livestock and wildlife. Additional water developments for livestock or wildlife also would benefit wild horses. It is unlikely, however, that the number and location of water sources would be substantially altered under Alternative A.

*Vegetation.* Vegetation treatment and restoration would continue at levels comparable to or somewhat above historic levels. These restoration treatments would affect wild horse populations where they occur within herd management areas and the total herd management area affected at any one time could be in the tens of thousands of acres.

*Fish and Wildlife.* Management of fish and wildlife resources, particularly big game species such as pronghorn, mule deer, and elk would occasionally conflict with wild horses where these species compete for shared forage or water resources. This competition is most acute in some of the smaller and poorer condition herd management areas where forage and water are most limited. Generally, this competition would affect wildlife species more than wild horses.

*Special Status Species.* Under Alternative A, continued deterioration in ecological system health is expected to occur with the increased expansion of weedy annual species in the sagebrush ecological system, and continued expansion of pinyon and juniper into areas currently dominated by sagebrush communities. The cumulative loss of sagebrush habitat would increase the probability of the eventual listing of several additional sagebrush obligate species as either threatened or endangered. Following such regulatory action, the management of these listed species would become the priority activity in these areas, likely leading to major reductions in resource allocations to other multiple uses, including wild horses. In that event, various herd management areas overlapping the designated critical habitat of such listed species could be substantially reduced or eliminated.



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*Lands and Realty.* The lands that are proposed for possible disposal under Alternative A include only about 400 acres within herd management areas and, thus, would not affect wild horses. Any additional parcels disposed of would be subject to additional NEPA review prior to disposal.

*Travel Management and Off-highway Vehicle Use.* Continually increasing recreational demand in the District, accompanied by increased off-road vehicle use, would gradually result in increased conflicts with wild horses. Most of the increased recreation and off-highway vehicle use is expected to occur in the southern portions of the District where habitat for wild horses is typically of marginal quality and some herd management areas have appropriate management levels of zero. Increasing recreation and transportation areas activities in these herd management areas may result in these herds moving to areas with less noise and activity, potentially resulting in conflicts outside the herd management areas.

*Recreation.* The primary interactions between wild horses and recreation are those associated with off-highway vehicle use (see paragraph above) and other dispersed recreation activities such as hunting and hiking. In addition, one special recreation management area would be established under Alternative A. Its use is not anticipated to affect wild horse herds.

*Livestock Grazing.* Management of grazing allotments under Alternative A would be essentially unchanged and would not be expected to result in new impacts on wild horse management. Where they occur, usually where appropriate management levels have not been achieved, existing conflicts for forage and water resources would continue.

*Mineral Extraction.* Mineral exploration and development would continue to impact wild horse herds on a very localized basis when such activities are located within herd management areas. Effects on wild horses would be considered under the site-specific NEPA analyses conducted for these activities. Most of these activities (e.g., oil and gas exploration and development) involve limited acres of disturbance, but increased traffic and human activity may interrupt wild horse movements and normal use patterns within a herd management area.

*Watershed Management.* The increased forage production on the treated areas would provide improved forage and habitat for livestock, wildlife, and wild horses. Under Alternative A, the additional forage would be allocated 70 percent to livestock and wild horses and 30 percent to wildlife in the Schell Resource Area. In the remainder of the District, additional forage would be allocated proportionately among all users.

*Fire Management.* Although wild horse habitat on the various herd management areas may be adversely affected by wildfires in the short term, rehabilitation of burned areas commonly increases the forage available for wild horses, thus creating long-term benefits. Similarly, fire use fires would be used to enhance habitat for wild horses, livestock, and wildlife. The area burned annually is expected to gradually increase over time under Alternative A.

*Noxious and Invasive Weed Management.* Noxious weed management could affect wild horse herds if noxious and invasive weeds occur within the herd management areas to the extent that they replace desirable forage species, thereby reducing availability of quality forage. Some weeds are more toxic to



horses than to other types of grazers. Under Alternative A, it is highly probable that the spread of invasive alien species would continue at a rate greater than the rate of weed eradication and vegetation treatment.

*Special Designations.* Under Alternative A, there would be no new effect of special designations on wild horses.

**Conclusion.** Alternative A would maintain several herd management areas that possess marginal or inadequate habitat to sustain wild horse populations at a level that would ensure genetic viability of the herd, thereby resulting in a high probability for continued conflicts with other resources, conflicts with private land owners, and occasional starvation and dehydration of wild horses.

### **Alternative B**

**Impacts from Wild Horses Management Direction.** Under this alternative, wild horses would be managed in a reduced number (6) of consolidated herd management areas covering approximately 3.7 million acres as shown in **Table 2.5-9**. As illustrated on **Map 2.4-3**, this alternative would retain most large herd management areas and small units adjacent to them. Boundaries would be consistent with neighboring districts and agencies. The appropriate management level would be managed as a range between 810 to 1,695 animals, rather than a fixed number as in Alternative A. This alternative would focus wild horse management on maintenance of healthy, viable herds that would not require supplemental feeding or other emergency actions during occasional drought years.

In Alternative B, proposed appropriate management levels reflect the recent evaluation using multi-tiered analysis. The first tier consisted of determining if each herd management area had the five essential habitat components and herd characteristics: forage, water, cover, space, and genetic viability. If one or more of these components were missing, the herd management area was considered unsuitable. If all components were present, the analysis proceeded to the second tier. In the second tier, monitoring data were used to establish the appropriate management level. Key forage utilization, use pattern mapping, and frequency were considered and if allotment objectives were being met, the highest value of historical ranges was used to set the appropriate management level. Where allotment objectives were not being achieved, appropriate management level was set on census data relative to range utilization or the need for emergency wild horse gathers, which suggested overpopulations. Wild horses would no longer be managed in a number of herd management areas considered unsuitable for year-long occupation by horse herds. These areas total approximately 1.57 million acres, including the units shown in **Table 4.8-1**.

This alternative would result in the removal from management of approximately 1.57 million acres of current herd management areas that provide very limited habitat for wild horses or which do not provide enough suitable habitat to sustain viable thriving herds in these areas. The total reduction in appropriate management level within the District associated with this alternative would be approximately 446 animals or about 21 percent of current appropriate management level for the whole District.



**Table 4.8-1**  
**Herd Management Areas Eliminated in Alternative B**

<b>Herd Management Area</b>	<b>Public Land Area (acres)</b>	<b>Appropriate Management Level Range (no. of animals)</b>
Applewhite	31,000	1
Blue Nose Peak	85,000	1
Clover Creek	33,000	1-14
Clover Mountains	173,000	1-16
Delamar Mountains	186,000	51-85
Highland Peak (southern 2/3)	92,000	0
Jakes Wash	154,000	1-21
Little Mountain	53,000	9-15
Meadow Valley Mountains	97,000	0
Miller Flat	21,000	9-15
Moriah	55,000	1-29
Rattlesnake (southern 1/2)	36,000	0
Seaman	361,000	159
White River	117,000	90
<b>Totals</b>	<b>1,565,000</b>	<b>324-446</b>

Under Alternative B, all appropriate management levels would be expressed as a range with the upper level of the range based on available habitat and the lower level based on the projected recruitment rate between gather cycles as developed from herd monitoring data. The upper limit of the range would be the level at which the maximum number of wild horses could exist without causing resource damage. This population range would ensure that a thriving natural ecological balance is obtained since each herd would be managed in a manner designed to not exceed habitat limitations.

Under Alternative B, several of the smallest herds would be removed and the animals placed for adoption. The described actions would result in a less crowded environment, with less competition (from the surplus horses) for designated critical habitat and limited resources.

Boundary fences would be constructed along the perimeter of herd management areas where necessary to achieve management objectives, including reduction of conflicts with domestic livestock.

Wild horses would be managed in areas only where habitat conditions can support a long-term genetically viable population. This approach is necessary to achieve a balance between horse populations and the habitat needed to support them on a sustained basis. The resultant herds are expected to be healthier and less susceptible to starvation, disease, and predation.



### Impacts from Other Programs.

*Water Resources.* It is unlikely that the number and locations of water sources within the retained herd management areas would be substantially altered under Alternative B. Therefore, the interactions and impacts would be the same as Alternative A.

*Vegetation.* This alternative would allow an intensive effort toward ecological restoration and a reversal of the ecological system deterioration within the District with total treatment area being substantially greater than that of Alternative A. These restoration treatments would affect wild horse populations where they occur within herd management areas and to the extent that the population may have to be reduced for a few years while the desired vegetation becomes established. Assuming that treatment activities affect herd management areas proportionately to their distribution within the District, and assuming that 2 years of establishment without grazing are desirable for seedling establishment following seeding, the maximum total area affected at any one time could be in excess of 100,000 acres. Total exclusion of wild horses from freshly seeded areas probably would not be practical, but in some herd management areas it may be necessary to fence selected areas or modify water sources to attract animals away from such areas or reduce numbers below the low range of the appropriate management level.

*Fish and Wildlife.* Competition with wildlife for forage and water resources would occur in this alternative as in Alternative A, but these conflicts would be reduced by removing from management those herd management areas where forage and water resources are most limited. This competition would generally favor wild horses over wildlife where the resources are limited.

*Special Status Species.* The aggressive landscape restoration activities of this alternative are expected to slow and reverse the historic deterioration in ecological system health. When successful, this effort would substantially reduce the likelihood of additional species within the sagebrush ecological system being listed as either threatened or endangered. Thus, there is a lower probability of sensitive species management affecting wild horses under this alternative than under Alternative A.

*Lands and Realty.* Under Alternative B, an area of approximately 87,834 acres would be available for potential disposal including approximately 17,400 acres within herd management areas. Potential disposal of lands in these areas would have minor effects on wild horses on the herd management areas identified under this alternative, and could necessitate a reduction in the appropriate management level of affected herd management areas.

*Travel Management and Off-highway Vehicle Use.* The reduction of both size and number of herd management areas and the substantial reduction in amount of area open to off-highway vehicle use in this alternative would effectively reduce encounters and conflicts between off-road vehicle traffic and wild horse herds. The areas still open to off-highway vehicles in this alternative do not overlap with the remaining herd management areas. Therefore, impacts of the increasing recreational demand on the District on wild horses would be reduced in this alternative compared to Alternative A.



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*Recreation.* Eight special recreation management areas totaling approximately 2.4 million acres would be established under Alternative B. Portions of these would overlap with the Eagle, Silver King, and Triple B Herd Management Areas. Some recreational users would seek out opportunities to view wild horses and may affect herd behavior and movement by their presence. Overall, however, recreational use of these areas is expected to be dispersed with only negligible to minor effects to wild horse herds.

*Livestock Grazing.* Management of grazing allotments under Alternative B would include closure of grazing on approximately 3.0 million acres of bighorn sheep habitat, portions of which occur within various herd management areas. Thus, competition for forage and water resources would be reduced in these areas of livestock closure. Other areas of existing conflict would be eliminated or reduced in those areas where herd management area status is dropped and the wild horses are removed.

*Mineral Extraction.* Mineral exploration and development would continue to impact wild horse herds on a very localized basis when such activities are located within herd management areas. Effects on wild horses would be considered under the site-specific NEPA analyses conducted for these activities. Overall effects to the wild horse management program under this alternative may be somewhat greater than for Alternative A since other provisions of this alternative may facilitate mineral development over a wider array of locations.

*Watershed Management.* Under Alternative B, additional forage resulting from vegetation treatment and restoration activities would be allocated to watershed health and wildlife, thus there would be no net impact to wild horses.

*Fire Management.* The use of fire as a vegetation management tool would be substantially greater under Alternative B than Alternative A, potentially resulting in greater areas of new seedings and reduced habitat for wild horses on a temporary basis. Long-term habitat improvements on the treated areas would provide better feed for the maintenance of wild horses. Restoration of vegetation resilience and return to historical fire regimes would reduce impacts to wild horses when fires occur.

*Noxious and Invasive Weed Management.* Weed treatment options under Alternative B would be the same as under Alternative A and impacts would be similar. However the vegetation treatment and restoration efforts under this alternative would help slow the spread of invasive species from those areas being treated and improve habitat for wild horses.

*Special Designations.* None of the existing or proposed Areas of Critical Environmental Concern overlap with the herd management areas proposed under this alternative. None of the other special designation categories are likely to pose noticeable conflicts with wild horse management. Therefore, no impacts to wild horses are anticipated.

**Conclusion.** Wild horse populations would be brought into balance with the available habitat resources needed to sustain genetically viable herds and prevent damage to the environment and surrounding resources. Vegetation treatments would, in the long term, enhance habitat conditions within the herd



management areas to ensure the sustainability of healthy herds maintained at appropriate management levels.

### **Alternative C**

**Impacts from Wild Horses Management Direction.** Under Alternative C, wild horses would be managed in the same reduced set of consolidated herd management areas as used in Alternative B. The only differences would occur in areas identified for possible disposal where the potential disposal areas would no longer remain in herd management area status. The total area of the herd management areas could be reduced by approximately 31,000 acres in areas identified for proposed land disposals. This slight reduction in size of the Eagle and Silver King Herd Management Areas is not considered enough to warrant a change in the proposed appropriate management level for these units.

Wild horse populations would be managed with the same approach for calculating and applying appropriate management level as in Alternative B. Only limited fencing of herd management area boundaries would be done as with Alternative A. No land disposals would be permitted to remove the habitat necessary for supporting long-term genetically viable populations. Overall, these management directions are expected to result in only minor changes in impacts from Alternative B.

### **Impacts from Other Programs.**

Under Alternative C, the impacts related to interactions from vegetation, livestock grazing, watershed management, and noxious and invasive weed management activities would be the same as or similar to Alternative B. Programs for which the impacts would differ from Alternatives A and B are discussed below.

*Water Resources.* It is unlikely that the number and locations of water sources within the retained herd management areas would be substantially altered under Alternative C. Therefore the interactions and impacts would be the same as Alternative A.

*Fish and Wildlife.* It is expected that the interrelated impacts associated with this resource program would be generally similar to those under Alternative B except that much of the vegetation restoration would focus on restoration to a range of desired conditions compatible with commodity production that may provide better forage for wild horses.

*Special Status Species.* It is expected that the interrelated impacts associated with this resource program would be essentially the same as under Alternative B. However, this alternative does not place as much emphasis as Alternative B on the restoration of suitable habitat for sagebrush obligate species. Thus, this alternative involves a higher risk, albeit not as high as Alternative A, for the eventual listing of some of these species under the Endangered Species Act. Should such a listing occur, it likely would affect wild horse management by restricting the types of restoration treatments that could be applied within the herd management areas.



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*Lands and Realty.* Under Alternative C, the lands identified for possible disposal (288,744 acres) would be approximately ten times that of Alternative A. Potential disposal of lands in these areas could reduce the herd management areas identified under this alternative by approximately 31,000 acres, likely necessitating a reduction in the appropriate management level.

*Travel Management and Off-highway Vehicle Use.* The reduction of both size and number of herd management areas and the substantial reduction in amount of area open to off-highway vehicle use in this alternative would effectively reduce encounters and conflicts between off-road vehicle traffic and wild horse herds. Four of the six areas still open to off-highway vehicles in this alternative do not overlap with the remaining herd management areas. Two areas, however, Silver State and Pancake Summit, overlap almost totally with the Silver King and Pancake Herd Management Areas, respectively. Some degree of impact to the wild horse population in those herd management areas would be expected. However, overall impacts of the increasing recreational demand on the District on wild horse management probably would be reduced in this alternative compared to Alternative A.

*Recreation.* The primary impacts resulting from interactions between wild horses and recreation are those associated with off-highway vehicle use (see paragraph above). In addition, ten special recreation management areas totaling approximately 3.3 million acres would be established under Alternative C. Portions of these would overlap with the Eagle, Silver King, Triple B, and Pancake Herd Management Areas. Wild horse viewing is one of the types of recreation anticipated to occur in these areas and the presence of recreation users may affect herd behavior and movement. Recreational use of these areas, however, is expected to be dispersed with only negligible to minor effects to wild horse herds.

*Mineral Extraction.* Mineral exploration and development would continue to impact wild horse herds on a very localized basis when such activities are located within herd management areas. Effects on wild horses would be considered under the site-specific NEPA analyses conducted for these activities. It is expected that impacts of such activities to the wild horse management program would be comparable to or somewhat greater under Alternative C than for Alternative A since other provisions of this alternative may facilitate mineral development in a wider array of locations within the District.

*Watershed Management.* Impacts to wild horses would be the same as Alternative B except that additional forage after restoration would be allocated to livestock.

*Fire Management.* Impacts to forage on herd management areas and thereby to wild horses would probably be less in Alternative C than Alternatives A and B during the short term due to aggressive fire suppression. Over the long term, however, this fire suppression approach is expected to result in more large widespread fires, potentially burning major portions of individual herd management areas with subsequent conversion of these areas to herbaceous dominated plant communities.

*Special Designations.* None of the existing or proposed Areas of Critical Environmental Concern overlap with the herd management areas proposed under this alternative. None of the other special designation categories are likely to pose noticeable conflicts with wild horse management. Therefore, no impacts to wild horses are anticipated.



**Conclusion.** Wild horse populations would be brought into balance with the available habitat resources needed to sustain genetically viable herds and prevent damage to the environment and surrounding resources. Alternative C, however, would likely have greater impacts and risks to wild horse populations than Alternative B over the long term due to increased potential for major wildfires.

#### **Alternative D**

**Impacts from Wild Horses Management Direction.** Under Alternative D, herd management areas would be the same as under Alternative A, but herds would be unmanaged except for removal of wild horses outside the herd management areas. This alternative, however, would focus on eliminating livestock grazing throughout the District to protect vegetation and soil resources. This approach could initially make more forage available to wild horses in those herd management areas where horses and livestock currently compete for forage. This alternative also eliminates other discretionary uses of the public lands including mineral sale and leasing, lands and realty actions, and many recreational uses. This approach would remove or eliminate most resource use conflicts with wild horses, but it would not alter substantially or remedy the unsuitability of several existing herd management areas for maintaining viable, healthy horse populations in thriving ecological balance with other resources. It also would not constrain population growth within herd management areas. Thus, in the absence of population controls, it is expected that natural population growth would quickly result in excessive populations and rapid degradation of forage supplies on all herd management areas. Riparian areas within the herd management areas would be particularly vulnerable. As forage supplies become depleted within the herd management areas, it is expected that increasing numbers of animals would move onto adjoining areas where they would be removed. Starvation would be common as would be long-term or permanent damage to the vegetation resource. Foals and old animals would be the most vulnerable to starvation and predation.

#### **Impacts from Other Programs.**

*Water Resources.* Under Alternative D, water hauls and other man-made sources of water for livestock would be terminated, thus removing important water sources for wild horses and wildlife as well.

*Vegetation.* Vegetation treatment and restoration activities would occur under this alternative at about the same scale as Alternative A, but emphasis would be placed on returning previously disturbed sites (including nonnative seedings) to sagebrush or pinyon-juniper communities. Thus, impacts to wild horses would be similar to Alternative A, except that Alternative D would involve a lower overall probability of achieving and maintaining desired range of vegetation conditions within the herd management areas. This would lead to greater impacts on the health of wild horse populations.

*Fish and Wildlife.* Actions related to this interaction would focus on natural processes with an elimination or major reduction of active habitat management, including limitation or removal of numerous artificial water sources, used by wild horses as well as wildlife.



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*Special Status Species.* Actions related to this interaction would be similar to Alternative A, and, in many respects, the interactions with wild horses are expected to be the same. There would be a substantial risk for a future listing of some of the sagebrush-obligate species under the Endangered Species Act with associated risk to wild horse management.

*Lands and Realty.* This alternative emphasizes a policy of "No net loss of lands in the planning area." No new rights-of-way, permits, leases, and easements would be granted. This approach would not directly affect wild horse herds.

*Travel Management and Off-highway Vehicle Use.* Under this alternative, almost all of the District would be closed to off-highway vehicle use, effectively eliminating any conflict of such uses with wild horse herds.

*Recreation.* Alternative D would involve elimination of organized recreational events, thereby eliminating a potential use conflict in herd management areas.

*Livestock Grazing.* Livestock grazing would be eliminated under Alternative D. This would remove the conflict between livestock and wild horse for forage, but also would eliminate some of the water sources used by the wild horse herds.

*Mineral Extraction.* Under Alternative D, major portions of the Ely District would be closed to fluid mineral leasing and solid mineral leasing, thus minimizing conflicts between mineral development activities and wild horses.

*Watershed Management.* After restoration activities have occurred to meet Standards for Rangeland Health at the watershed level, additional forage would be allocated to wild horses within herd management areas.

*Fire Management.* This alternative would involve the use of fire suppression only for human-caused events and those that threaten high ecological values, human life, and private property. For both the short term and the long term, this alternative would result in substantially greater risk for large, widespread fires that could adversely affect entire herd management areas or large portions thereof.

*Noxious and Invasive Weed Management.* Management would be the same as Alternative A except selected groups of herbicides would not be allowed. Thus, effective and efficient control of some weed species may not be achieved. This change would have negligible to minor direct effects relative to wild horses, but would substantially reduce the effectiveness of weed control in the District. This approach would tend to facilitate the establishment and spread of various noxious and invasive weeds.

*Special Designations.* Under Alternative D, no new ACECs or other special designations would be proposed and the existing ACEC designations would be dropped. These actions would not affect wild horse management.



**Conclusions.** The passive management approach in Alternative D for the existing 24 herd management areas and absence of fire management would result in rapid deterioration of ecological systems within these areas and likely starvation of many animals as populations increase beyond the support level of their habitat.

### Alternative E

**Impacts from Wild Horses Management Direction.** Alternative E involves the same six herd management areas proposed under Alternative B. The management approach in these areas would be the same as Alternative B, except that no possible land disposals would be permitted that reduce habitat conditions from being able to support a long-term genetically viable population. The emphasis of wild horse management would be on maintenance of healthy, viable herds at levels sustainable under drought conditions. Within these parameters, the program-specific impacts are expected to very similar to Alternatives B and C, which differ only in minor degree.

### **Impacts from Other Programs.**

**Water Resources.** It is unlikely that the number and locations of water sources within the retained herd management areas would be substantially altered under Alternative E. Therefore, the interactions and impacts would be the same as Alternative A.

**Vegetation.** Impacts to wild horses from vegetation treatment activities would be similar to Alternative B.

**Fish and Wildlife.** The management actions associated with fish and wildlife under this alternative are not expected to result in noticeable conflicts or impacts with regard to wild horses.

**Special Status Species.** The management actions associated with special status species under this alternative are not expected to result in noticeable conflicts or impacts with regard to wild horses.

**Lands and Realty.** Under Alternative E, the lands identified for possible disposal would be generally similar to but slightly greater than Alternative B. Potential disposal of lands in these areas would have minor effects on the herd management areas identified under this alternative but could necessitate a reduction in the appropriate management level.

#### ***RMP Management Focus***

*The restoration and maintenance of healthy ecological systems within watersheds is a primary focus for the future management of the Ely District. Healthy ecological systems are geographically diverse and change over time. They are compatible with soil potential and are resilient to disturbance.*

*Resources and resource uses will be managed to restore or maintain ecological health. Certain resource management changes and active treatments may need to be implemented, in portions of watersheds, to accomplish this objective. Adaptive management will be pursued to avoid deteriorating conditions favoring invasive plants and catastrophic fires. Any projects will be implemented so as to result in a mosaic of vegetation within a watershed.*

*In the long term, natural disturbance (such as drought or fire) will occur and fewer treatments will be needed to maintain ecological health. The result will be a variety of vegetation phases within a watershed, which will provide diverse, healthy conditions for future generations.*



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*Travel Management and Off-highway Vehicle Use.* The reduction of both size and number of herd management areas and the substantial reduction in amount of area open to off-highway vehicle use in this alternative will effectively reduce encounters and conflicts between off-road vehicle traffic and wild horse herds. Four of the six areas still open to off-highway vehicles in this alternative do not overlap with the remaining herd management areas. Two areas, however, Silver State and Pancake Summit, overlap almost totally with the Silver King and Pancake Herd Management Areas, respectively. Some degree of impact to the wild horse population in those herd management areas would be expected. However, overall impacts of the increasing recreational demand on the District on wild horse management probably would be reduced in this alternative compared to Alternative A.

*Recreation.* Interactions between wild horses and recreation under Alternative E would be the same as Alternative B.

*Livestock Grazing.* Management of grazing allotments under Alternative E would not involve changes likely to affect wild horse management. Existing conflicts, anticipated only if appropriate management level is not achieved, for forage and water resources would be eliminated or reduced in those areas where herd management area status is dropped and the horses are removed.

*Mineral Extraction.* Mineral exploration and development would continue to impact wild horse herds on a very localized basis when such activities are located within herd management areas. Effects on wild horses would be considered under the site-specific NEPA analyses conducted for these activities. It is expected that impacts of such activities to the wild horse management program would be comparable to or somewhat greater under Alternative E than for Alternative A since other provisions of this alternative may facilitate mineral development in a wider array of locations within the District.

*Watershed Management.* Under Alternative E, additional forage resulting from vegetation treatment and restoration would be allocated to livestock, wild horses, and wildlife. This would provide a long-term increase in forage for wild horses where treatments are implemented within herd management areas.

*Fire Management.* The interaction and impacts associated with fire management are the same as Alternative B.

*Noxious and Invasive Weed Management.* The interaction and impacts associated with weed management are the same as Alternative A.

*Special Designations.* None of the existing or proposed Areas of Critical Environmental Concern overlap with the herd management areas proposed under this alternative. None of the other special designation categories are likely to pose noticeable conflicts with wild horse management. Therefore, no impacts to wild horses are anticipated.

**Conclusion.** Wild horse populations would be brought into balance with the available habitat resources needed to sustain genetically viable herds and prevent damage to the environment and surrounding



resources. Vegetation treatments would, in the long term, enhance habitat conditions within the herd management areas to ensure the sustainability of healthy herds maintained at appropriate management levels.



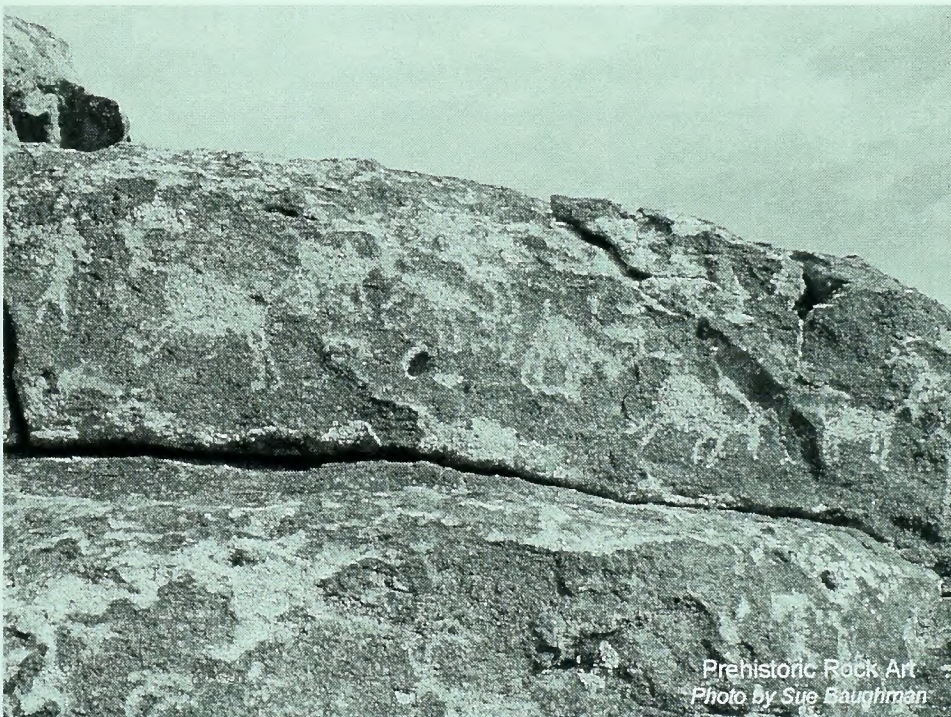




## 4.9 Cultural Resources

### Impact Issues

Cultural resources include, but are not limited to, historic cemeteries and townsites, rockshelters, caves, rock art, and PaleoIndian sites. The primary impact mechanisms that could affect cultural resources within the Ely District include off-highway vehicle and recreational use, minerals development, land disposal, fire, special designations, and livestock grazing. Some of these mechanisms would have a negative impact on cultural resources, which would be mitigated through project abandonment, redesign, and, if necessary, data recovery. However, some of these mechanisms may have a positive or beneficial impact on cultural resources, such as protection under an ACEC designation.



Any program, activity, or project has an effect on a cultural resource if it alters any of the characteristics or criteria that may qualify the resource for inclusion on the National Register of Historic Places or otherwise affects a cultural property's legally protected status. Impacts to cultural properties are considered adverse if the effect diminishes the integrity of the property's location, design, setting, materials, workman-ship, feeling, or association. Adverse effects can include, but are not limited

to: physical destruction of or damage to all or part of a property; alteration of a property (e.g., restoration, rehabilitation, stabilization); removal of a property from its historic location; or, transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation.

### Assumptions for Analysis

None.

### Interactions with Other Programs

The Cultural Resource management program within the Ely District potentially would be affected by actions within the resource management programs for wild horses, visual resources, lands and realty, travel



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management and off-highway vehicle use, recreation, livestock grazing, geology and mineral extraction, fire management, noxious and invasive weed management, and special designations.

**Goal – Identify, protect, and classify at-risk archaeological resources, significant historic properties, and cultural landscapes.**

### Alternative A

**Impacts from Cultural Resources Management Direction.** Under Alternative A, the cultural landscape around National Historic Trails would be managed and protected in compliance with the National Historic Preservation Act and instructional memoranda Instructional Memorandum NV-2004-004 and Instructional Memorandum NV-2004-006. An area of direct effect around the trails would be established as 1 mile from the trail centerline, although in some cases, the area of potential effect may be larger than 1 mile from the centerline. Alternative A focuses on management of the setting of the Pony Express National Historic Trail and the California Historic Trail, of which the Ely District manages about 15 miles.

Class II inventories (sample surveys) would be conducted in areas identified as high potential for aboriginal site occurrence (i.e., rock art sites, rockshelters, caves, toolstone sources or quarries, large or complex prehistoric sites and camps, agave roasting pits, antelope walls, geoglyphs, and intaglios [i.e., engraved designs]). Rock art sites, historic sites, agave roasting pits, antelope walls, geoglyphs, and intaglios would be monitored for vandalism and natural-caused deterioration.

A Cultural Resources Project Plan would be developed for the Mount Irish Archaeological District, Delamar townsite, and Sunshine Locality. The plan would outline protection measures and discuss use allocation objectives for these sites, as well as specify actions to be taken under the plan. The Delamar townsite and cemetery would be inventoried to determine the cultural and historical value.

Under Alternative A, cultural resources would continue to be managed for future Cultural Resource Use Allocations. Direct impacts to historic properties eligible to the National Register of Historic Places would be avoided or mitigated in accordance with federal and state laws. Indirect impacts in the form of illegal collecting, vandalism, or inadvertent damage to cultural resources would continue to increase over time as the number of visitors to the area increases.

### **Impacts from Other Programs.**

*Vegetation.* Vegetation management involves active and passive treatments to achieve healthy, resilient, and diverse ecological systems. Active restoration typically involves direct manipulations of vegetation resources and includes such activities as burning, chaining, tree cutting, and plowing, all of which can negatively affect cultural resources. Active restoration treatments would be subject to NEPA review and impacts to cultural resources would be avoided or mitigated in adherence to the National Historic Preservation Act and Federal Land Policy and Management Act. Passive restoration focuses on the elimination or modification of activities currently degrading watershed conditions, such as vehicle traffic, hiking, and livestock and wild horse grazing. The elimination or modification of these types of activities



would benefit cultural resources by restoring cultural landscapes and reducing impacts to archaeological sites. Under Alternative A, active and passive vegetation restoration activities would be undertaken at a relatively low level and implementation primarily would be in reaction to changes that occur from events such as fire or other disturbance.

*Wild Horses.* Cultural resources are impacted by wild horse use as part of the overall impact noted as livestock grazing impacts. These impacts are trampling, wallowing, and trailing, especially near fenced or unfenced watering areas, stream banks, and spring sources. The impacts caused by wild horses are nearly indistinguishable from those caused by livestock. These impacts would be mitigated on a case-by-case basis when discovered. Under Alternative A, wild horses would be managed within 24 management areas including several areas where scarcity of forage and water result in localized concentrations of use which can be destructive for any cultural resources in the vicinity.

*Visual Resources.* Management under Visual Resource Management Classes I and II would best preserve and protect the visual setting where cultural resources occur. See **Table 2.4-1** for the amount of acreage managed under Visual Resource Management Class I and II designations for Alternative A.

*Lands and Realty.* Lands and realty management would negatively impact cultural resources, most substantially in land exchanges and land sales. Under Alternative A, no substantial impacts to cultural resources are anticipated as a result of potential land disposals already authorized. Any additional parcels disposed of would be subject to additional NEPA review prior to disposal in adherence to the National Historic Preservation Act, the Federal Land Policy and Management Act, and the National Trails System Act. Implementation of standard operating procedures would prevent lands identified for possible disposal from being transferred to other ownership if they contain sites determined eligible for inclusion to the National Register of Historic Places.

As with land tenure actions, the negative impacts created by the construction of rights-of-way corridors (e.g., transmission lines and pipelines) would be mitigated by adherence to the National Historic Preservation Act and Federal Land Policy and Management Act. Under Alternative A, no additional corridors would be designated and all linear rights-of-way would be encouraged to locate within existing designated corridors.

Under this alternative, the number of acres withdrawn from mineral entry would be determined on a case-by-case basis.

*Renewable Energy.* Ground-disturbing activities associated with renewable energy development (i.e., solar or wind energy) would result in mitigated impacts to cultural resources. Authorization of renewable energy projects would be evaluated using an interdisciplinary approach and site-specific NEPA analysis would occur for all renewable energy development projects. Impacts to cultural resources would be avoided or mitigated in compliance with the National Historic Preservation Act and Federal Land Policy and Management Act. Under Alternative A, no areas would be designated as potential solar or wind energy development areas.



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*Travel Management and Off-highway Vehicle Use.* Off-highway vehicle activities, particularly if unregulated, are increasingly responsible for damage to all types of cultural resources. Compaction, altered surface water drainage, and erosion are all negative impacts to the landscape and, by extension, to cultural resources. The weight and torque of off-road vehicles easily can destroy fragile surface artifacts. In addition, as off-highway vehicles take people into generally unvisited or hard-to-reach areas, the integrity of cultural resources would be at greater risk of illegal collection, vandalism, surface disturbance, and site damage. Planned off-highway vehicle events would be cleared and impacts mitigated in accordance with the National Historic Preservation Act and Federal Land Policy and Management Act; however, the impacts caused by dispersed off-highway vehicle activity would not be mitigated unless discovered. Under Alternative A, it is anticipated that occurrences of illegal collecting and vandalism associated with off-highway vehicle use would be high due to the open class use designation in the District.

Under Alternative A, no organized off-highway vehicle events would be permitted in the Baker Archaeological Site or Garrison Archaeological Site areas, thereby providing some level of resource protection.

*Recreation.* Recreation development projects would be cleared and impacts to cultural resources mitigated through adherence to the National Historic Preservation Act and Federal Land Policy and Management Act. Beyond that, recreation development can be both beneficial and detrimental in its relationship to cultural resources. On the one hand, a greater use of interpretive developments can increase public awareness and education, which can result in decreased illegal collecting and site vandalism. On the other hand, increased development, in general, brings more people to the area and more visitors usually means greater illegal collection and site damage. Developed recreation can be slightly more detrimental to cultural resources than dispersed recreation because it tends to concentrate people in small, predictable areas. Dispersed recreation (e.g., hunting, hiking) tends to attract visitors to places that have not received much use in the past; however, this type of use is much less predictable and measurable. The effects of dispersed recreation would be mitigated on a case-by-case basis as discovered.

*Livestock Grazing.* Under Alternative A, direct impacts associated with range improvements would be mitigated; however, other impacts may occur as a result of livestock grazing activities. Livestock congregation and trailing at or across cultural resource site locations can damage artifacts and the contexts in which they occur. Cattle shading and rubbing can damage standing historic structures and petroglyph and pictograph panels. Excessive trampling at spring sources and along stream banks, cattle trailing, and poorly managed grazing can all lead to a denuding of protective vegetation cover and create indirect impacts to cultural resources by accelerating natural erosion and exposing artifacts to illegal surface collection and vandalism. These types of impacts generally would be localized at particular site locations, and could range from short-term to long-term to irreversible. Impacts associated with livestock activities would be mitigated on a case-by-case basis as discovered.

*Mineral Extraction.* Under Alternative A, surface-disturbing activities associated with mineral exploration and development would result in mitigated impacts to cultural resources. The potential for indirect and inadvertent impacts would increase proportionally to the amount of land developed, which is expected to total approximately 15,600 acres over the next 20 years. Impacts to cultural resources associated with



mineral extraction would be avoided or mitigated in compliance with the National Historic Preservation Act, Federal Land Policy and Management Act, and standing terms and conditions for mineral leasing. However, once data recovery has been conducted at a given site, it limits or diminishes potential opportunities for future research and interpretation.

*Fire Management.* Wildfire suppression activities (e.g., off-highway vehicle use, bulldozing control lines, and occupation of fire camps) potentially can damage cultural resources through surface compaction and soil displacement. Under Alternative A, the current fire management plan would be implemented, which includes areas where fires would be beneficial and where they may have negative effects. Impacts associated with wildfire suppression would be mitigated on a case-by-case basis as discovered.

Areas proposed for prescribed burning would be inventoried for cultural resources and impacts avoided or mitigated. Prescribed fires can indirectly have a negative impact on archaeological sites by increasing short-term ground surface visibility. The greater visibility makes artifacts more accessible and can lead to increased illegal collection. These short-term impacts are mitigated through prior inventory, systematic surface artifact collection, and post-fire monitoring.

Under Alternative A, puebloan sites would be protected from vehicular traffic associated with fire suppression in the event of fire on or near these sites. Existing standard operating procedures would protect fire-sensitive cultural resources (i.e., rock art sites, historic buildings and structures) located within fire management polygons.

*Noxious and Invasive Weed Management.* Treatment methods for noxious and invasive weed control include chemical, mechanical, cultural, or biological. Of greatest concern are chemical and mechanical treatments, which can negatively impact cultural resources. These impacts would be mitigated primarily through avoidance or data recovery in adherence to the National Historic Preservation Act.

*Special Designations.* Special designations (e.g., ACECs), with a greater emphasis on natural values, would benefit cultural resources by protecting and preventing irreparable damage to important cultural values, as well as historic and scenic values. The designation of special management areas would reduce or eliminate surface disturbances, which often are caused by activities such as off-highway vehicle use, grazing, range improvements, rights-of-way placements, and mineral entry. Restricting these activities would result in increased ground cover, leading to a reduction in soil erosion, which would help to maintain the integrity of cultural sites. While a special designation may emphasize one or more unique resource, other existing multiple-use management can continue within a special designation so long as the uses do not impair the values for which the area was designated.

Under Alternative A, no new ACECs would be designated. The Kane Springs, Mormon Mesa, and Beaver Dam Slope ACECs previously were established and currently exist under Alternative A. These ACECs are managed through the Approved Caliente MFP Amendment and Record of Decision for the Management of Desert Tortoise Habitat and corresponding Biological Opinion.



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**Conclusion.** Under Alternative A, cultural resources would continue to be managed for future resource use allocations. Indirect impacts associated with off-highway vehicle use, wild horses, livestock grazing, and recreational activities would continue to occur under existing management.

### Alternative B

**Impacts from Cultural Resources Management Direction.** Under Alternative B, all cultural properties in the Ely District, whether already recorded or projected to occur on the basis of existing data synthesis, including cultural landscapes, would be allocated to specific uses according to their nature and relative preservation value. Once a cultural resource receives a use allocation it would be managed for that use, and other resource uses would be excluded if not compatible with the use allocation designation. See Section 2.5.9 for the definitions of each resource use allocation and designation of specific use allocations for site types found in the District.

### **Impacts from Other Programs.**

*Vegetation.* Under Alternative B, fewer impacts to cultural resources would occur in comparison to Alternative A due to the proactive approach and increase in vegetation restoration treatments designed to improve vegetation resiliency and restore ecological systems. Active restoration methods would be subject to NEPA review, and impacts would be avoided or mitigated in adherence to the National Historic Preservation Act and Federal Land Policy and Management Act.

*Wild Horses.* Under Alternative B, wild horses would be managed in a reduced number of consolidated herd management areas (see Section 2.5.8), thus reducing the potential for impacts to cultural resources in those areas where the animals are being removed.

*Visual Resources.* Under Alternative B, more acres would be managed as Visual Resource Management Class II than under Alternative A (see **Table 2.4-1**). This potentially would result in more indirect protection for cultural resources than under Alternative A.

*Lands and Realty.* Cultural resource impacts associated with possible land disposal management activities would be the same as described for Alternative A except that there would be an increase in lands identified for potential disposal (see Section 2.5.12). Under Alternative B, newly designated rights-of-way corridors (0.5-mile-wide under this alternative) potentially would result in a greater number of cultural resources impacts compared to Alternative A under which no additional rights-of-way corridors would be designated. However, all linear rights-of-way related to fiber optic cables and specific transmission lines and pipelines would be located within designated right-of-way corridors; thereby, reducing dispersed rights-of-way and resulting in fewer potential impacts to cultural resources.

*Renewable Energy.* Under Alternative B, areas would be identified as potential solar and wind energy development areas (see Section 2.5.13). Direct impacts to cultural resources would be avoided or mitigated in adherence to the National Historic Preservation Act and Federal Land Policy and Management Act. Additionally, if important cultural resources are located in areas proposed for renewable energy projects,



development would be restricted if not compatible with the cultural resource use allocations. Renewable energy development would not be restricted to areas identified as potential wind or solar development areas.

*Travel Management and Off-highway Vehicle Use.* Under this alternative, fewer impacts to cultural resources would be anticipated since there would be a decrease in the area open to off-highway vehicle use and an increase in the area closed to off-highway vehicle use in comparison to Alternative A (see Section 2.5.14).

*Recreation.* Under this alternative, two special recreation permit areas would be established to maximize opportunities for motorcycle events. Direct impacts to cultural resources located within the permit areas would be mitigated through adherence to the National Historic Preservation Act and Federal Land Policy and Management Act. However, it is anticipated that a greater number of indirect impacts to cultural resources located in the vicinity of the motorcycle events would occur due to the increased number of visitors to these areas. Indirect impacts would be mitigated on a case-by-case basis as discovered.

*Livestock Grazing.* It is anticipated that livestock grazing management activities under Alternative B would result in fewer impacts to cultural resources compared to Alternative A, because there would be a decrease in the areas available for livestock grazing (see Section 2.5.8), and better management and restored forage base through restoration activities could slightly reduce impacts or could be used to draw animals away from concentrating in or near sensitive areas.

*Mineral Extraction.* It is anticipated that mineral extraction activities would affect the same amount of acreage as under Alternative A. Direct impacts to cultural resources would be avoided or mitigated in adherence to the National Historic Preservation Act, Federal Land Policy and Management Act, and standard terms and conditions for mineral leasing. Additionally, if cultural resources were located in areas proposed for mineral extraction, development would be restricted if not compatible with the cultural resource use allocations.

*Fire Management.* Under Alternative B, fire use would be implemented to the greatest extent possible to increase native vegetation resiliency as part of watershed restoration. This alternative would have less impact on cultural resources than Alternative A because through the watershed analysis process mitigation would take place prior to changes in the fire plan. This includes mitigation for cultural resources and potential identification of additional sites.

*Noxious and Invasive Weed Management.* Impacts to cultural resources would be the same as those identified for Alternative A.

*Special Designations.* Under Alternative B, 18 new ACECs would be designated and 11 of these would be designated to protect and preserve relevant and important cultural values. These would include Baker Archaeological Site, Ward Mining District, Snake Creek Indian Burial Cave, Shooting Gallery, Hendry's Creek/Rock Animal Corral, Honeymoon Hill/City of Rocks, Mt. Irish, Pahroc Rock Art, Rose Guano Bat



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Cave, Osceola/Osceola Ditch, and Condor Canyon. Designation of these ACECs would help protect cultural resources.

**Conclusion.** There would be a higher level of protection of cultural resources through use allocations, with 100 percent of the sites determined eligible to the National Register of Historic Places allocated and managed for Conservation, Scientific, and/or Public Use, and the designation of 11 new ACECs. There also would be more protection of cultural resources than Alternative A due to the decrease in lands open to off-highway vehicle use, wild horses, and livestock grazing. The level of protection from impacts associated with fire management would be greater than Alternative A, whereas the level of protection from impacts associated with recreation activities would be lower than Alternative A.

### Alternative C

**Impacts from Cultural Resources Management Direction.** Cultural resource impacts as a result of program-specific management activities would be similar to those described for Alternative B; however, the magnitude of effects would vary based on the resource use allocations identified for this alternative (see Section 2.5.9, Cultural Resources).

**Impacts from Other Programs.** Cultural resource impacts associated with mineral extraction and noxious and invasive weed management activities would be similar to those described for Alternative A. Impacts associated with wild horses, visual resources, and renewable energy would be the same as described for Alternative B. The following interrelated programs would result in different impacts compared to Alternatives A and B.

*Vegetation.* Under Alternative C, vegetation restoration activities would be accelerated in comparison to Alternative A; however, treatments would focus on creation of plant communities conducive to the commodity emphasis of this alternative. These treatments would involve greater reliance on mechanical and chemical treatments as opposed to prescribed fire. This approach would result in greater potential impacts to cultural resources compared to Alternatives A and B.

*Lands and Realty.* Cultural resource impacts associated with possible land disposals would be the same as those identified for Alternative A except for the increased acreage available for possible disposal. Under Alternative C, cultural resource impacts associated with newly designated rights-of-way corridors would be the same as described for Alternative B, with the exception that these corridors would be 3 miles in width. All linear rights-of-way related to fiber optic cables and specific transmission lines and pipelines would be encouraged to locate within designated rights-of-way corridors; therefore, the potential for cultural resource impacts associated with these types of rights-of-way would be the same as described for Alternative A.

*Travel Management and Off-highway Vehicle Use.* Under Alternative C, fewer impacts to cultural resources are anticipated because there would be a decrease in the number of acres open to off-highway vehicle use and an increase in the number of acres where off-highway vehicle use would be limited to designated roads and trails compared to Alternative A (see Section 2.5.14).



*Recreation.* Under Alternative C, indirect impacts to cultural resources are expected to increase because there would be a greater number of special recreation permit areas for motorcycle and truck events compared to Alternative A.

*Livestock Grazing.* Under Alternative C, there would be a slight decrease in the areas available for livestock grazing (see Section 2.5.8) and better management and restored forage base through restoration activities could slightly reduce impacts or used to draw animals away from concentrating in or near sensitive areas.

*Fire Management.* The full suppression approach of Alternative C would initially reduce potential impacts to cultural resources but could increase impacts when fuel accumulations reach the point that suppression efforts fail to control large fires.

*Special Designations.* Under Alternative C, 20 new ACECs would be designated, of which 11 would be designated to protect and preserve relevant and important cultural values. The 11 new ACECs would be the same as those identified for Alternative B.

**Conclusion.** Cultural resource use allocations would provide greater protection of cultural resources than Alternative A; however, there would be a lower level of protection compared to Alternative B since more sites would be allocated as Discharged from Management. The decrease of lands open to off-highway vehicle use would provide more protection of cultural resources than Alternative A, but not to the extent of Alternative B. The level of protection from impacts associated with recreation and fire management would be lower than Alternatives A and B.

### Alternative D

**Impacts from Cultural Resources Management Direction.** Cultural resource impacts as a result of program-specific management activities would be similar to those described for Alternative B; however, the magnitude of effects would vary based on the resource use allocations identified for this alternative (see Section 2.5.9, Cultural Resources).

**Impacts from Other Programs.** Cultural resource impacts associated with wild horses, special designations, and noxious and invasive weed management activities would be the same as described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Vegetation.* Under Alternative D, vegetation restoration activities would not be accelerated in comparison to Alternative A. Restoration would be implemented primarily in areas dominated by invasive nonnative species or seeded nonnative species. Impacts to cultural resources would be similar to Alternative A.



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*Visual Resources.* Under Alternative D, more acres would be managed as Visual Resource Management Class II than under Alternative A (see Section 2.5.11). This potentially would result in more indirect protection for cultural resources than under Alternative A.

*Lands and Realty.* Under Alternative D, there would be no net loss of public lands in the District. As a result, there would be a lower potential for impacts to cultural resources as activities on lands retained under BLM-jurisdiction would be subject to the requirement of the National Historic Preservation Act and Federal Land Policy Management Act. Under Alternative D, there would be no new land use authorizations such as rights-of-way designation, so there would be no impacts to cultural resources.

*Renewable Energy.* Under Alternative D, there would be no impact to cultural resources from renewable energy development because there would be no new land use authorizations.

*Travel Management and Off-Highway Use.* Under this alternative, fewer impacts to cultural resources would be anticipated since there would be a decrease in the number of acres open to off-highway vehicle use and an increase in the area closed to off-highway vehicle use in comparison to Alternative A (see Section 2.5.14).

*Recreation.* Under Alternative D, there would be fewer impacts to cultural resources compared to Alternative A because no outfitter and guide permits for hunting would be issued and no motorcycle and truck events would be permitted.

*Livestock Grazing.* Under this alternative, fewer impacts to cultural resources would occur compared to Alternative A because livestock grazing would be eliminated throughout the District (see Section 2.5.16).

*Fire Management.* Alternative D would emphasize reduced suppression of wildland fires except to protect life and property. Under this alternative, the potential for effects to cultural resources would be higher compared to Alternative A and in the long term would be similar to Alternative C.

**Conclusion.** More cultural resources would be allocated and managed for Conservation Use, which would provide a higher level of protection compared to Alternatives B and C. The level of protection of cultural resources from off-highway vehicle use, recreation, and livestock grazing would be greater than Alternatives A, B, and C. Under this alternative, fire management activities would pose a higher risk to cultural resources than Alternatives A, B, and C.

### Alternative E

**Impacts from Cultural Resources Management Direction.** Under Alternative E, cultural resource impacts associated with program-specific management activities would be the same as described for Alternative B.

**Impacts from Other Programs.** Cultural resource impacts associated with mineral extraction and noxious and invasive weed management activities would be the same as described for Alternative A. Impacts associated with vegetation, wild horses, visual resources, renewable energy, travel management and



off-highway vehicle use, fire, and special designation management activities would be the same as described for Alternative B. The following interrelated programs would result in different impacts compared to Alternatives A, B, and C.

*Lands and Realty.* Cultural resource impacts associated with potential land disposals would be similar to those identified for Alternative B. Under this alternative, newly designated right-of-way corridors (0.5-mile-wide under this alternative) potentially would result in a greater number of cultural resources impacts compared to Alternative A under which no additional rights-of-way corridors would be designated. All linear rights-of-way related to fiber optic cables and specific transmission lines and pipelines would be encouraged to locate within designated rights-of-way corridors; therefore, the potential for cultural resource impacts associated with these types of rights-of-way would be the same as described for the Alternative A.

*Recreation.* Under this alternative, there would be limitations on the number of outfitter and guide permits, which would potentially reduce indirect impacts to cultural resources. However, the increase in the number of permitted motorcycle and truck events would result in more impacts to cultural resources compared to Alternative A.

*Livestock Grazing.* Under Alternative E, there would be similar areas available for livestock grazing compared to Alternative A (see Section 2.5.16). Better management and restored forage base through restoration activities could slightly reduce impacts or could be used to draw animals away from concentrating in or near sensitive areas.

**Conclusion.** Management of cultural resources would be the same as Alternative B. The level of protection from recreation activities would be greater than Alternatives A, B, and C, but not to the extent of Alternative D.







## 4.10 Paleontology

### Impact Issues

Impacts to paleontological resources would be measured by physical damage to fossil-bearing formations through excavation or surface disturbance. The primary impact mechanisms that could affect paleontological resources within the Ely District include off-highway vehicle use, minerals development, land disposal, and special designations. However, some of these mechanisms may have positive or beneficial impacts on paleontological resources.

Fossils are part of the geological units in which they occur and may be extensively distributed both vertically and horizontally throughout the unit. Fossil localities noted to occur within a given geologic unit indicate that the unit may yield fossils throughout its entire areal extent, which may be several hundred or several thousand square miles. Thus, knowledge of the outcrop pattern of geologic units, and the kinds and quality of the fossils produced by such units, is a critical management tool for land-use decision-making where fossils may be involved.

### Assumptions for Analysis

- Since it is uncertain where every paleontological site is located in the District, the analysis of the different management actions that can directly or indirectly impact paleontological resources is only by estimation.

### Interactions with Other Programs

The paleontology management program within the Ely District potentially would be affected by actions within the resource management programs for lands and realty, travel management and off-highway vehicle use, recreation, and geology and mineral extraction.

**Goal – Identify and manage at-risk paleontological resources (scientific value), preserve and protect vertebrate fossils through best science methods, and promote public and scientific use of invertebrate and paleobotanical fossils.**

### Alternative A

**Impacts from Paleontology Management Direction.** Under this alternative, paleontological resources would be managed for future resource use allocation.

### **Impacts from Other Programs.**

*Lands and Realty.* Potential land disposals would not impact known paleontological resources, because the resources would be surveyed prior to land transfers and important paleontological resources would be eliminated from possible disposal parcels. Acquiring lands containing sensitive fossil localities



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would benefit paleontological resources by protecting the resource for future public and scientific use. Proposed rights-of-way corridors would be inventoried prior to construction. Fossil specimens located during inventory would be documented and collected. The documentation would add to the body of knowledge about paleontological resources in the District; however, any discovered paleontological resources located in proposed disturbance areas would be permanently removed from their original context.

*Travel Management and Off-highway Vehicle Use.* Unrestricted off-highway vehicle use damages paleontological resources by soil compaction, altered surface water drainage, and erosion. Repeated rock climbing and damage to slopes, soils, and vegetation would result in damage to paleontological resources by directly wearing down rock formations or causing accelerated erosion. Under Alternative A, the potential for impacts to paleontological resources would be high due to the open class use designation in the District.

*Recreation.* The demand for use of both vertebrate and invertebrate fossils has increased in the District, as well as the casual-use and collection of invertebrate fossils, in particular trilobites, by rockhounds and fossil collectors. Common invertebrate fossils, such as plants, mollusks, and trilobites may be collected for personal use in reasonable quantities, but may not be bartered or sold. Under Alternative A, no registration system currently is in place for invertebrate fossil collecting. In the Ely District, illegal commercial collecting of trilobites and individuals collecting far more than is considered "reasonable quantities" of trilobites for personal use is occurring, both of which impact the resource.

*Mineral Extraction.* Mineral extraction would have the potential to affect paleontological resources. An inventory of paleontological resources would be required prior to ground-disturbing activities associated with mineral development, as well as documentation or collection of specimens uncovered during operations. The documentation would add to the body of knowledge about paleontological resources in the District; however, any discovered paleontological resources located in proposed disturbance areas would be permanently removed from their original context.

**Conclusion.** Paleontological resources would be managed for future use allocations. No registration system would be in place for trilobite collecting. The amount of unauthorized collecting of common invertebrate fossils (e.g., trilobites) and impacts associated with off-highway vehicle use would continue to increase as recreation and visitor use increases.

### Alternative B

**Impacts from Paleontology Management Direction.** Under Alternative B, all paleontological resources in the Ely District, whether already recorded or projected to occur on the basis of existing data synthesis, would be allocated for specific uses according to their nature and relative preservation value. The use allocations would reduce mitigated impacts thereby increasing the preservation of paleontological resources. See Section 2.5.10 for the definitions of use allocations and their application for specific types of paleontological resources.



**Impacts from Other Programs.** The level of impacts to paleontological resources associated with mineral extraction would be the same as those identified for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Lands and Realty.* Impacts associated with land disposals would be the same as described for Alternative A, except for the increased acreage available for possible disposal. Under Alternative B, newly designated rights-of-way corridors (0.5-mile-wide under this alternative) potentially would result in a greater number of paleontological resources impacts compared to Alternative A under which no additional rights-of-way corridors would be designated. However, all linear rights-of-way related to fiber optic cables and specific transmission lines and pipelines would be located within designated rights-of-way corridors; thereby, reducing dispersed rights-of-way and the associated potential impacts to paleontological resources.

*Travel Management and Off-highway Vehicle Use.* Under this alternative, fewer impacts to paleontological resources would be anticipated since there would be a decrease in the area open to off-highway vehicle use and an increase in the area closed to off-highway vehicle use compared to Alternative A (see Section 2.5.13).

*Recreation.* Under this alternative, a no fee registration system would be established for known trilobite localities. It is anticipated that the no fee registration system would be used as a management tool to track the number of people visiting these localities and associated impacts. If necessary, trilobite collecting localities would be closed if increased use is impacting the resource.

**Conclusion.** Paleontological resources would be provided a higher level of protection under this alternative because they would be allocated and managed for Scientific, Conservation, and/or Public Use. An increase in the number of acres withdrawn from mineral entry and a decrease in lands open to off-highway vehicle use would reduce impacts to paleontological resources. The no-fee registration system would increase the protection of known trilobite localities by tracking the amount of use and associated impacts.

### Alternative C

**Impacts from Paleontology Management Direction.** Under Alternative C, paleontological resource impacts associated with program-specific management activities would be the same as described for Alternative B.

**Impacts from Other Programs.** The level of impacts to paleontological resources associated with mineral extraction would be the same as those identified for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Lands and Realty.* Under Alternative C, more lands would be available for disposal; however, surveys would be conducted prior to land transfers and important paleontological resources would be eliminated from possible disposal parcels. Paleontological resource impacts associated with newly designated rights-of-way corridors would be the same as those described for Alternative B, with the exception that these corridors would be 3 miles in width. All linear rights-of-way related to fiber optic cables and specific



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transmission lines and pipelines would be encouraged to locate within designated rights-of-way corridors; therefore, the potential for paleontological resource impacts associated with these types of rights-of-way would be the same as described for Alternative A.

Under this alternative, there would be an increase in lands withdrawn from mineral entry compared to Alternative A, which would reduce impacts to paleontological resources (see Section 2.5.12).

*Travel Management and Off-highway Vehicle Use.* Under Alternative C, fewer impacts to paleontological resources would be anticipated since there would be a decrease in the area open to off-highway vehicle use in comparison to Alternative A (see Section 2.5.13). Paleontological resource impacts associated with the number of acres closed to off-highway vehicle use would be the same as described for Alternative A.

*Recreation.* Under this alternative, a fee-based registration system would be established for known trilobite localities. It is anticipated that the fee-based registration system would be used as a management tool to track the number of people visiting these localities and associated impacts. If necessary, trilobite collecting localities would be closed if increased use is impacting the resource.

**Conclusion.** Management of paleontological resources would be the same as Alternative A, with the exception of the registration system. The fee-based registration system could reduce the number of trilobite collectors, as well as increase the protection of trilobite collecting localities and associated impacts by tracking the amount of use and associated impacts. The decrease in lands open to off-highway vehicle use would reduce impacts to paleontological resources, but not to the extent of Alternative B.

### Alternative D

**Impacts from Paleontology Management Direction.** Under Alternative D, impacts to paleontological resources as a result of program specific management activities would be the same as described for Alternative B.

**Impacts from Other Programs.** The level of impacts to paleontological resources associated with mineral extraction would be the same as those identified for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Lands and Realty.* Under Alternative D, there would be no net loss of public lands nor new land use authorizations such as rights-of-way designations in the District, which would benefit paleontological resources.

*Travel Management and Off-highway Vehicle Use.* Under Alternative D, fewer impacts to paleontological resources would be anticipated since there would be a decrease in the area open to off-highway vehicle use and an increase in the number of acres closed to off-highway vehicle use in comparison to Alternative A (see Section 2.5.13).



*Recreation.* Under this alternative, all trilobite collecting locations would be closed, which would reduce impacts to the resource compared to Alternative A.

**Conclusion.** Management of paleontological resources would be the same as Alternative B, with the exception of trilobite collecting. Under this alternative, all trilobite collecting localities would be closed, which would provide a higher level of protection of these fossils compared to Alternatives A, B, and C. The increase in lands closed to off-highway vehicle use would reduce impacts to paleontological resources.

#### **Alternative E**

**Impacts from Paleontology Management Direction.** Under Alternative E, impacts to paleontological resources associated with program-specific management activities would be the same as described for Alternative B.

**Impacts from Other Programs.** The effects to paleontological resources associated with travel and off-highway vehicle use and recreation would be the same as described for Alternative B. Impacts associated with mineral extraction management activities would be the same as described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Lands and Realty.* Paleontological resource impacts associated with potential land disposals would be the same as those described for Alternative A except for the increased acreage available for possible disposal. Under this alternative, newly designated rights-of-way corridors (0.5-mile-wide under this alternative) potentially would result in a greater number of paleontological resource impacts compared to Alternative A under which no additional rights-of-way corridors would be designated. All linear rights-of-way corridors related to fiber optic cables and specific transmission lines and pipelines would be encouraged to locate within designated rights-of-way corridors; therefore, the potential for paleontological resource impacts associated with these types of rights-of-way would be the same as described for Alternative A.

Under this alternative, the number of acres withdrawn from mineral entry would be the same as Alternative B (see Section 2.5.12).

**Conclusion.** Paleontological resources would be provided a higher level of protection under this alternative because they would be allocated and managed for Scientific, Conservation, and/or Public Use. An increase in the number of acres withdrawn from mineral entry and a decrease in lands open to off-highway vehicle use would reduce impacts to paleontological resources. The no-fee registration system would increase the protection of known trilobite localities by tracking the amount of use and associated impacts.







## 4.11 Visual Resources

### Impact Issues

The primary impact issue associated with visual resources management is surface disturbing activities that are a result of management actions of other resource programs.

### Assumptions for Analysis

None.

### Interactions with Other Programs

The visual resources management program within the Ely District potentially would be affected by actions within the resource management programs for vegetation, wild horses, lands and realty, renewable energy, travel management and off-highway vehicle use, recreation, livestock grazing, woodland and native plant products, geology and mineral extraction, watershed management, fire management, noxious and invasive weed management, and special designations.

**Goal – Manage public land actions and activities consistent with District visual resource management class objectives.**

### Alternative A

**Impacts from Visual Resources Management Direction.** Under Alternative A, visual resource management classes would use the visual inventory compiled for the Schell and Caliente Resource Areas, as presented in **Map 2.4-4**, Visual Resources Management Classes Alternative A. Class I areas are wilderness, wilderness study areas, and scenic areas. Acreage classified within the four visual resource management classes are presented in **Table 2.4-1**. The remainder of the Ely District, (the Egan Resource area) currently is unclassified and would establish visual resource management classes at the site-specific project level.

### Impacts from Other Programs.

*Vegetation/Watershed Management.* Under Alternative A, visual resources could potentially be affected by vegetation treatments and watershed management activities. In the event that rectangular treatment blocks are used for restoration, an unnatural appearance could be created in a characteristic landscape. Additionally, vegetation manipulation also could create a short term unnatural appearance during treatment activities, with less apparent impacts in the long term. Prioritization of treating areas near wildland urban interface areas might make these impacts more apparent.

*Wild Horses.* Under Alternative A, wild horse management would have minimal impacts on visual resources. Under this alternative, the construction of boundary fences would occur along the perimeter of



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herd management areas only where herd management areas and livestock grazing allotments coincide. This fencing would impact visual resources of existing landscapes. However, the level of impact would be minimal in most locations.

*Lands and Realty.* Under Alternative A, land and realty activities such as permitting rights-of-way, communication site development, and unauthorized use potentially would impact visual resources. However, implementation of mitigation measures based on the visual resources management classes would minimize these impacts. The effort to limit large linear projects and communication sites to existing corridors would localize impacts to visual resources, but also would potentially increase visual impacts in the viewsheds where these existing corridors are located.

*Renewable Energy.* Under Alternative A, renewable energy development would have impacts on visual resources similar to those discussed for rights-of-way and utility corridors. Impacts also would result from installation of windmills, solar towers, and large photovoltaic fields.

*Travel Management and Off-highway Vehicle Use.* Under Alternative A, travel management and off-highway vehicle use would result in impacts to visual resources. The open designation for most of the District would result in impacts from off-highway vehicle use, including route proliferation, potential air quality degradation, vegetation loss, soil exposure, and soil loss.

*Recreation.* Under Alternative A, there would be a potential for recreation management to affect visual resources. Development of recreation facilities may occur under this alternative, potentially causing impacts to visual resources. However, implementation of mitigation measures for developed facilities based on the visual resources management classes would minimize these impacts.

*Livestock Grazing.* Under Alternative A, livestock grazing activities could impact visual resources. New fencing would impact the visual resources of existing landscapes. Additionally, grazing activities within riparian areas and other vegetation communities potentially would impact visual resources through vegetation loss and soil exposure.

*Woodland and Native Plant Products.* Under Alternative A, the private and commercial use of woodland and native plant products would have minimal impacts on visual resources. Plant collection activities and Christmas tree collection would have limited impacts on visual resources in and adjacent to collection areas. However, under the woodland products program, all operations would be restricted to areas where resource surveys have been conducted, which would include visual resource management assessment.

*Mineral Extraction.* Under Alternative A, mineral extraction would impact visual resources. Authorization of surface-disturbing and surface occupying activities related to mining, oil and gas development, and geothermal development would impact visual resources. However, these impacts would be limited to approximately 15,600 acres of reasonably foreseeable development estimated for the next 20 years. Additionally, mitigation measures would be required for development based on the Visual Resource Management classes, thereby reducing impacts to visual resources.



*Fire Management.* Under Alternative A, fire management activities have the potential to substantially affect visual resources. Long-term impacts may result from surface disturbing suppression activities such as the use of bulldozers to construct fire line and the driving of fire equipment cross-country. Fire use and prescribed fire activities would likely have a short-term impact on visual resources. Long-term impacts to visual resources would vary according to spatial arrangement, vegetation mosaics created, and proximity to high-use locations such as recreation areas.

*Noxious and Invasive Weed Management.* Under Alternative A, noxious and invasive weed management would have minimal impacts on visual resource management. Treatment of weed species would have the potential to impact visual resources if monoculture seeding were used following treatment.

*Special Designations.* Under Alternative A, special designations would have minimal impact on visual resources. No new special designations are proposed under this alternative.

**Conclusion.** Management prescriptions for Class I and II areas (approximately 1.09 million acres and 326,000 acres, respectively) would continue to preserve the scenic character of these lands. Although unclassified areas totaling approximately 3.6 million acres would be addressed on a site-specific project level, there potentially could be impacts by not having a comprehensive framework for addressing visual resources in place, in the old Egan Resource Area. Continued designation of areas open to cross-country off-highway vehicle use would result in visual impacts through surface disturbances and impacts to air quality.

### **Alternative B**

**Impacts from Visual Resources Management Direction.** Under Alternative B, visual resource management would be based on the revised visual inventory compiled for the District and presented on **Map 2.4-5**, Visual Resources Management Classes Alternatives B and E. Acreages for the four visual resource management classes are presented in **Table 2.4-1**.

**Impacts from Other Programs.** Visual resource impacts associated with renewable energy, recreation, mineral extraction, and noxious and invasive weed management activities would be similar to those described for Alternative A. The following resource programs would result in different impacts compared to Alternative A.

*Vegetation/Watershed Management.* Under Alternative B the areas affected by vegetation treatments would be greater than Alternative A, as the use of prescribed fire would be maximized under this alternative. This would result in a noticeable change in landscape appearance during the short term on treated areas.

*Wild Horses.* Under Alternative B, wild horse management would have minimal impacts on visual resources. Under this alternative, the construction of boundary fences would occur along the perimeter of herd management areas only where herd management areas and livestock grazing allotments coincide. This fencing would impact visual resources of existing landscapes. However, the level of impact would be



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minimal in most locations. Because there would be approximately 1.76 million less acres of wild horse herd management areas under this alternative, the impacts to visual resources would be slightly less.

*Lands and Realty.* Under Alternative B, land and realty activities such as designating utility corridors, permitting rights-of-way, communication sites development, and unauthorized use potentially would impact visual resources. However, implementation of mitigation measures based on the visual resources management classes would minimize these impacts. The effort to limit large linear projects within designated 0.5-mile-wide corridors and to co-locate communication sites would localize impacts to visual resources, but also would potentially increase visual impacts in the viewsheds where these existing corridors are located.

*Travel Management and Off-highway Vehicle Use.* Under Alternative B, travel management and off-highway vehicle use would reduce impacts on visual resources by eliminating cross-country off-highway vehicle use which could reduce surface disturbances and air quality impacts.

*Livestock Grazing.* Livestock grazing would be closed on approximately 3.6 million acres beyond the existing closures in Alternative A. Grazing closure over this area could potentially lead to changes in the visual character of the area due to greater height and abundance of herbaceous ground cover during and after the growing season.

*Woodland and Native Plant Products.* Under Alternative B, limitations on the gathering of woodland and native plant products would reduce impacts on visual resources.

*Fire Management.* Under Alternative B, fire management activities have the potential to substantially affect visual resources. Long-term impacts may result from surface disturbing suppression activities such as the use of bulldozers to construct fire lines and the driving of fire equipment cross-country. Prescribed fire and managed natural fire activities, which would be maximized under this alternative, may have short-term impacts on visual values. Long-term impacts to visual resources would vary according to spatial arrangement, vegetation mosaics created, and proximity of treatments to high-use locations such as recreation areas.

*Special Designations.* Under Alternative B, special designations would have the potential to reduce impacts to visual resources through special management. While two areas would be removed from scenic area designation because they do not meet the criteria, several new areas would be given special designations.

**Conclusion.** Management prescriptions under this alternative would increase the amount of land in Visual Resource Management Class II by over 2.2 million acres. Having classifications for all lands within the District would allow for a more comprehensive framework for preserving and mitigating impacts to visual resources. Maximizing the use of prescribed fire would create short term visual impacts that would diminish in the long term after treatments are completed.



### Alternative C

**Impacts from Visual Resources Management Direction.** Under Alternative C, visual resource management would be based on the revised visual inventory compiled for the District and presented on **Map 2.4-6**, Visual Resources Management Classes Alternative C. Acreages for the four visual resource management classes are presented in **Table 2.4-1**.

**Impacts from Other Programs.** Under Alternative C, visual resource impacts associated with renewable energy, recreation, livestock grazing, mineral extraction, and noxious and invasive weed management activities would be similar to those described for Alternative A. Visual resource impacts associated with vegetation/watershed management, wild horses, travel management and off-highway vehicle use, and special designations would be similar to those described for Alternative B. The following resource programs would have different impacts compared to Alternatives A or B.

*Lands and Realty.* Under Alternative C, land and realty activities such as permitting rights-of-way, communication sites development, and unauthorized use potentially would impact visual resources. However, implementation of mitigation measures based on the visual resources management classes would minimize these impacts. The effort to encourage large linear projects to locate within existing corridors or newly designated corridors three miles wide, and the lack of explicit emphasis on co-locating communication sites would lead to greater localized impacts to visual resources, and also would potentially increase visual impacts in the viewsheds where these existing corridors are located. The location of the Spring Valley utility corridor adjacent to Highway 893 would make surface disturbances more apparent in that area. Designating utility corridors to be 3 miles wide would create greater localized impacts than the other alternatives.

*Woodland and Native Plant Products.* Under Alternative C, increased gathering of woodland and native plant products would impact visual resources in both the short and long term.

*Fire Management.* Under Alternative C, wildland fires would be suppressed, reducing impacts to visual resources from fire in the short term. However, long-term impacts may result from surface disturbing suppression activities such as the use of bulldozers to construct fire line and the driving of fire equipment cross-country, and it is likely that there would be long-term effects caused by wildfires that would occur once suppression become impossible due to increased fuel accumulation.

**Conclusion.** Management prescriptions under this alternative would increase the amount of land in Visual Resource Management Class II by approximately 2.03 million acres. Having classifications for all lands within the District would allow for a more comprehensive framework for preserving and mitigating impacts to visual resources. Utility corridor widths of three miles and the location of the Spring Valley utility corridor adjacent to Highway 893 would create greater impacts in localized areas. Suppression of wildfires would reduce impacts from fire in the short term until wildland fires became impossible to suppress, which could lead to greater long-term impacts.



### Alternative D

**Impacts from Visual Resources Management Direction.** Under Alternative D, the entire planning area would be designated as either visual resources management Class I or Class II in order to protect scenic resources. Class I areas would be limited to wilderness, wilderness study, and scenic areas. The remainder of the district would be designated as Class II (**Map 2.4-7**). Projects would be required to be designed to minimize light pollution under this alternative. Acreages for the visual resource management classes under this alternative are presented in **Table 2.4-1**.

**Impacts from Other Programs.** Visual resource impacts associated with vegetation/watershed management, lands and realty, travel management and off-highway vehicle use, recreation, mineral extraction, and noxious and invasive weed management activities would be similar to those described for Alternative A.

**Wild Horses.** Wild horse populations would be uncontrolled on the 24 herd management areas. As populations expand beyond the carrying capacity of these areas, the herds would consume almost all available forage, causing these areas to appear denuded and barren.

**Renewable Energy.** Under Alternative D, renewable energy development would have minimal impacts on visual resources because no new land use authorizations would be issued, nor would new corridors be designated.

**Livestock Grazing.** Under Alternative D, livestock grazing activities would be have minimal impact on visual resources because livestock grazing would be eliminated.

**Woodland and Native Plant Products.** Under Alternative D, the elimination of the gathering of woodland and native plant products would have little impact in the short term, but could have long-term impacts of making these areas more susceptible to fires.

**Fire Management.** Under Alternative D, wildland fires would not be suppressed, potentially increasing impacts from fire to visual resources in the short term, and almost definitely resulting in long-term impacts as catastrophic fires cause large areas to be denuded.

**Special Designations.** Under the Alternative D, all special designation areas would be managed as a Class I visual resource; however, all special designations would be dropped. This would potentially allow visual impacts to occur in these areas.

**Conclusion.** Management prescriptions under this alternative increase the amount of land in Visual Resource Management Class II by almost 10 million acres. By identifying all areas as either Class I or II, substantial restrictions would be placed on activities that could be allowed under other resource management activities or increase the potential mitigation measures that would be required. The fact that there would be no new land use authorizations, such as rights-of-way, also would reduce impacts in the



short and long term. A policy of minimal fire suppression would create short term visual impacts which would increase over the long term as catastrophic fires occur.

### Alternative E

**Impacts from Visual Resources Management Direction.** Under Alternative E, visual resource management would be based on the revised visual inventory compiled for the District and presented on **Map 2.4-5, Visual Resources Management Classes Alternatives B and E**. Visual resource management class designations, associated management activities, and resulting effects would be similar to Alternative B.

**Impacts from Other Programs.** Visual resource impacts associated with renewable energy, recreation, livestock grazing, mineral extraction, and noxious and invasive weed management activities would be similar to those described for Alternative A. Visual resource impacts associated with vegetation/watershed management, wild horses, lands and realty, travel management and off-highway vehicle use, woodland and native plant products, fire management, and special designations management activities would be similar to those described for Alternative B.

**Conclusion.** Management prescriptions under this alternative would increase the amount of land in Visual Resource Management Class II by over 2.1 million acres. Having classifications for all lands within the District would allow for a more comprehensive framework for preserving and mitigating impacts to visual resources. Maximizing the use of prescribed fire and managed natural fire would create short term visual impacts that would diminish in the long term after treatments are completed.







## 4.12 Lands and Realty

### Impact Issues

One of the primary impact issues associated with lands and realty is that potential impacts to the lands and realty program often directly result from management actions of other resource programs. All land actions would be performed using an interdisciplinary approach with input from other resource programs in order to address potential resource conflicts. Site-specific NEPA analysis would be performed on all land actions.

### Assumptions for Analysis

- Land disposals would be limited to lands identified for possible disposal. Requests for possible disposals can be made for any BLM land and would be evaluated on a case-by-case basis.
- Identification of lands for possible disposal does not dictate that these lands would be sold or otherwise disposed.

### Interactions with Other Programs

The lands and realty management program within the Ely District potentially would be affected by actions within the resource management programs for vegetation, fish and wildlife, special status species, wild horses, cultural resources, visual resources, renewable energy, recreation, livestock grazing, geology and mineral extraction, and special designations.

**Goal 1 – Manage public lands in a manner that allows the retention of public land with high resource values and consolidates public land patterns to ensure effective administration and improve resource management. Make available for disposal public lands that promote community development. Utilize withdrawal actions with the least restrictive measures and minimum size necessary to accomplish the desired purpose.**

### Alternative A

**Impacts from Lands and Realty Management Direction.** Under Alternative A, management direction from Lands and Realty would allow some flexibility in conducting disposals, within the constraints imposed by the requirement of retaining lands to prevent damage to certain resources and habitat unless suitable replacement lands were acquired. Under Alternative A, a total of approximately 28,531 acres would be identified as available for possible disposal. This alternative does not sufficiently identify the up to 90,000 acres of public land that would be available for possible disposal under the Lincoln County Conservation, Recreation, and Development Act of 2004. Approximately 14,770 acres would be withdrawn from mineral entry.



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### Impacts from Other Programs.

*Vegetation.* Lands with wetland and riparian habitats or within functional floodplains would be retained unless mitigation measures were enacted or if these lands were exchanged for lands of equal or greater resource value. This could potentially reduce the land available for possible disposal. Withdrawal actions would continue to be evaluated on a case-by-case basis.

*Fish and Wildlife.* Habitat for big game and upland game would be retained unless mitigation measures were enacted or if these lands were exchanged for lands of equal or greater resource value. This could potentially reduce the land available for possible disposal. Withdrawal actions would continue to be evaluated on a case-by-case basis.

*Special Status Species.* Lands that support threatened or endangered species would not be available for possible disposal when disposal is determined to further endanger the species. Withdrawal actions would continue to be evaluated on a case-by-case basis.

*Wild Horses.* Lands included in wild horse herd management areas would be retained unless mitigation measures were enacted or if these lands were exchanged for lands of equal or greater resource value. This could potentially reduce the land available for possible disposal. Withdrawal actions would continue to be evaluated on a case-by-case basis.

*Cultural Resources.* Lands containing cultural resource sites eligible for the National Register of Historic Places would not be available for possible disposal unless mitigation measures were enacted or if these lands were exchanged for lands of equal or greater resource value. This could potentially reduce the land available for possible disposal. Withdrawal actions would continue to be evaluated on a case-by-case basis.

*Visual Resources, Renewable Energy, Recreation, Livestock Grazing, and Geology and Mineral Extraction.* The lands and realty program under Alternative A would consider acquisitions, retention, and possible disposals on a case-by-case basis under provisions of NEPA. Each possible land disposal proposal would be evaluated for conflicts with these resource programs. Withdrawal actions would continue to be evaluated on a case-by-case basis.

*Special Designations.* Under Alternative A, 17 areas totaling 12,705 acres would be segregated from possible disposal under the public land laws, including the general mining laws, but not the Act of June 14, 1926, commonly known as the Recreation and Public Purposes Act or the Mineral Leasing and Material Sale laws. An additional three areas totaling 2,490 acres would be segregated from possible disposal under the public land laws, but not the general mining laws, the Act of June 14, 1926, commonly known as the Recreation and Public Purposes Act, or the Mineral Leasing and Material Sale laws. Special designation areas are described in Section 2.5-22. Existing ACECs totaling approximately 212,500 acres would be withdrawn from surface entry.



**Conclusion.** Approximately 28,531 acres are identified for possible disposal and 14,770 acres are identified for withdrawal. This management direction does not identify additional lands for possible disposal that would meet the objectives of BLM, benefiting communities, or the Lincoln County Conservation, Recreation, and Development Act of 2004. There would not be a proactive effort toward identifying areas of sensitive or high resource values for withdrawal from entry.

### **Alternative B**

**Impacts from Lands and Realty Management Direction.** Under Alternative B, the lands and realty program management activities would allow greater flexibility in conducting disposals than under Alternative A. The management of other resource programs would provide a more focused direction for how their programs would influence land retention and acquisition. Under Alternative B, a total of approximately 87,834 acres would be identified as available for possible disposal. Each lands and realty action would be evaluated on a case-by-case basis for the presence of important resources to determine if disposal is appropriate. In addition to the pending and proposed withdrawals under Alternative A, lands with sensitive or high resource values would be withdrawn from all entry. Approximately 64,156 acres would be withdrawn from mineral entry.

**Impacts from Other Programs.** Effects to the lands and realty program associated with fish and wildlife, special status species and cultural resources management activities would be the same as described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Vegetation, Visual Resources, Renewable Energy, Recreation, Livestock Grazing, and Geology and Mineral Extraction.* Each land action would be evaluated on a case-by-case basis in accordance with NEPA to determine if disposal is appropriate. The proposed disposals would be evaluated for conflicts with these resource programs and would be required to meet the criteria for possible land disposals under Alternative B presented in Section 2.5.12. Proposals for potential disposal outside of the identified areas also would be required to meet these criteria for disposal.

*Wild Horses.* Disposals would be allowed in wild horse herd management areas on a case-by-case basis, when they would not prohibit free roaming behavior or eliminate enough habitat that the herd management area could no longer support a healthy, viable herd. The reduction of acreage of herd management areas from 5.36 million acres to approximately 3.6 million acres would potentially increase the amount of land available for disposal.

*Special Designations.* Under Alternative B, 12 areas totaling 11,630 acres would be segregated from disposal under the public land laws, including the general mining laws, but not the Act of June 14, 1926, commonly known as the Recreation and Public Purposes Act or the Mineral Leasing and Material Sale laws. One additional area of 1,210 acres would be segregated from possible disposal under the public land laws, but not the general mining laws, the Act of June 14, 1926, commonly known as the Recreation and Public Purposes Act, or the Mineral Leasing and Material Sale laws. Special designation areas are described in



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Section 2.5-22. Existing and newly designated ACECs totaling approximately 359,900 acres would be withdrawn from surface entry.

**Conclusion.** Approximately 87,834 acres would be available for possible disposal and approximately 64,156 acres would be withdrawn. Watershed analyses and subsequent restoration plans would identify lands to be retained as critical habitat for threatened or endangered species or habitat for other special status species. Withdrawing these sensitive and high resource value areas from surface and mineral entry would reduce land available for disposal as compared to Alternative A, but the removal of requirements pertaining to the retention of big game habitat, upland game habitat, and wild horse herd management areas would allow more flexibility in conducting lands and realty actions.

### Alternative C

**Impacts from Lands and Realty Management Direction.** Under Alternative C, the lands and realty program management activities would allow greater flexibility in conducting disposals than under Alternative A. The management of other resource programs would provide a more focused direction for how their programs would influence land retention and acquisition. Under Alternative C, a total of approximately 288,744 acres would be identified as available for possible disposal. Each lands and realty action would be evaluated on a case-by-case basis for the presence of important resources to determine if disposal is appropriate. In addition to the pending and proposed withdrawals under Alternative A, lands with sensitive or high resource values would be withdrawn from all entry. Approximately 200,243 acres would be withdrawn from mineral entry. The amount of acreage identified for possible disposal in Lincoln County exceeds the amount stipulated in the Lincoln County Conservation, Recreation, and Development Act of 2004.

**Impacts from Other Programs.** Lands and realty impacts associated with cultural resources management activities would be the same as described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Vegetation, Wild Horses, Visual Resources, Renewable Energy, Recreation, and Geology and Mineral Extraction.* All land actions would continue to be evaluated on a case-by-case basis in accordance with NEPA to determine if disposal is appropriate. Land actions also would be required to meet the criteria for possible land disposals under Alternative C presented in Section 2.5.12.

*Fish and Wildlife.* Retention of land with key/crucial wildlife habitat would occur on a case-by-case basis, thereby potentially reducing the land available for potential disposal.

*Special Status Species.* Lands and realty effects associated with special status species management activities would be similar to those described for Alternative A. However, under this alternative, lands designated as designated critical habitat for federally listed species may be disposed of to another agency for protection of the species.

*Wild Horses.* Disposals would be allowed in wild horse herd management areas on a case-by-case basis, when they would not prohibit free roaming behavior or eliminate enough habitat that the herd



management area could no longer support a healthy, viable herd. This could potentially increase the land available for possible disposal as compared to Alternative A. The reduction of acreage of herd management areas from 5.36 million acres to approximately 3.6 million acres would potentially increase the amount of land available for disposal.

*Livestock Grazing.* Approximately 7,843 acres in the Haypress allotment would be withdrawn and identified for possible disposal as a horse preserve. This allotment is currently permitted for horse use.

*Special Designations.* Under Alternative C, 12 areas totaling 11,630 acres would be segregated from disposal under the public land laws, including the general mining laws, but not the Act of June 14, 1926, commonly known as the Recreation and Public Purposes Act or the Mineral Leasing and Material Sale laws. One additional area of 1,210 acres would be segregated from possible disposal under the public land laws, but not the general mining laws, the Act of June 14, 1926, commonly known as the Recreation and Public Purposes Act, or the Mineral Leasing and Material Sale laws. Special designation areas are described in Section 2.5-22. Existing and newly designated ACECs totaling approximately 355,300 acres would be withdrawn from surface entry.

**Conclusion.** Approximately 288,744 acres would be available for possible disposal and approximately 200,243 acres would be withdrawn. The amount of land identified for potential disposal in Lincoln County exceeds the amount stipulated in the Lincoln County Conservation, Recreation, and Development Act of 2004. Watershed analyses and subsequent restoration plans would identify lands to be retained as critical habitat for threatened or endangered species. Withdrawing these sensitive and high resource value areas from surface and mineral entry would reduce land available for disposal as compared to Alternative A, but the removal of requirements pertaining to the retention of big game habitat, upland game habitat, wild horse herd management areas, special status species habitats, wetlands and riparian areas would allow more flexibility in conducting lands and realty actions.

#### **Alternative D**

**Impacts from Lands and Realty Management Direction.** Under Alternative D, no net loss, by acreage, of public land within the planning area would occur, greatly constraining the ability to resolve known unauthorized use of public lands and conduct other lands and realty actions. It does not identify additional lands for possible disposal that would meet the objectives of BLM, benefit communities, or the Lincoln County Conservation, Recreation, and Development Act of 2004.

**Impacts from Other Programs.** Lands and realty program impacts associated with vegetation, wild horses, cultural resources, visual resources, renewable energy, and geology and mineral extraction management activities would be the similar to those described for Alternative A.

*Fish and Wildlife.* Disposals would not be done in designated critical habitat, thereby potentially reducing the land available for potential disposal.



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*Special Status Species.* Disposals would not be done that could affect threatened and endangered species or their habitat, thereby potentially reducing the land available for potential disposal.

*Livestock Grazing.* All livestock grazing would be eliminated in the district, thereby potentially reducing conflicts with possible disposal. All areas, however, would still be subject to the no net loss of public land criteria for this alternative.

*Recreation.* The special recreation management area and all developed recreation sites would be eliminated, creating more acreage for possible disposal. This acreage would still be subject to the no net loss of public land criteria for this alternative.

*Special Designations.* Under Alternative D, although no disposals would be allowed in specially designated areas, all special designations would be dropped creating more acreage for possible disposal. This acreage would still be subject to the no net loss of public land criteria for this alternative.

**Conclusion.** Approximately 12,790 acres would be available for possible disposal and withdrawal. Because there would be no net loss of acreage managed by the BLM, no disposals would be available to occur to promote community development, unless they were offset by acquisitions. This would limit the ability of BLM to dispose of land for community and economic development, or for other purposes. Because requests for new withdrawals, withdrawal relinquishments, or modifications would be processed on a case-by-case basis, there would not be a proactive effort toward identifying areas of sensitive or high resource values for withdrawal from entry.

### Alternative E

**Impacts from Lands and Realty Management Direction.** Under Alternative E, the lands and realty program management activities would allow greater flexibility in conducting disposals than under Alternative A. The management of other resource programs would provide a more focused direction for how their programs would influence land retention and acquisition. Under Alternative E, a total of approximately 95,677 acres would be identified as available for possible disposal. Each lands and realty action would be evaluated on a case-by-case basis for the presence of important resources to determine if disposal is appropriate. In addition to the pending and proposed withdrawals under Alternative A, lands with sensitive or high resource values would be withdrawn from all entry. Approximately 71,999 acres would be withdrawn from mineral entry.

**Impacts from Other Programs.** Lands and realty program impacts associated with special status species and cultural resource management activities would be the same as described for Alternative A. The effects associated with special designations management activities would be similar to those described for Alternative B. The effects associated with wild horse management activities would be similar to those described for Alternative C. The following interrelated programs would result in different impacts compared to Alternatives A, B, and C.



*Vegetation, Fish and Wildlife, Visual Resources, Renewable Energy, Livestock Grazing, and Geology and Mineral Extraction.* All land actions would continue to be evaluated on a case-by-case basis under provisions of NEPA to determine if disposal is appropriate. Land actions also would be required to meet the criteria for possible land disposals under Alternative A presented in Section 2.5.12.

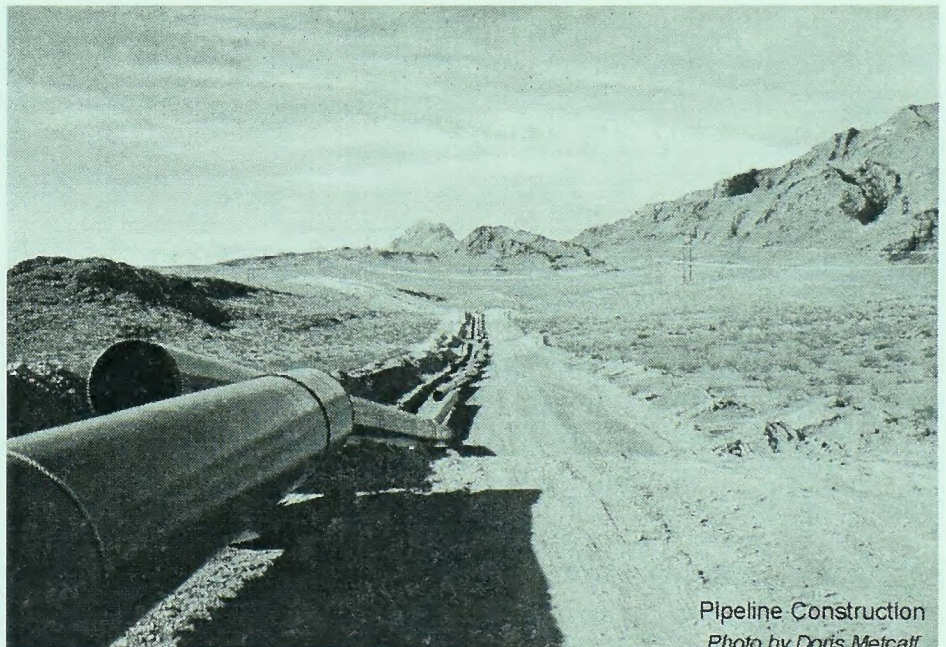
*Wild Horses.* Disposals would be allowed in wild horse herd management areas on a case-by-case basis, when they would not prohibit free roaming behavior or eliminate enough habitat that the herd management area could no longer support a healthy, viable herd. Withdrawals would continue to be evaluated in wild horse herd management areas on a case-by-case basis. This could potentially reduce the land available for possible disposal. The reduction of acreage of herd management areas from 5.36 million acres to approximately 3.6 million acres would potentially increase the amount of land available for disposal.

*Recreation.* Lands with developed recreation sites would not be disposed of. Additionally, potential disposals would not occur in areas of high recreational value unless suitable management of these values by state or county entities could be demonstrated.

*Livestock Grazing.* Approximately 7,843 acres in the Haypress allotment would be withdrawn and identified for possible disposal as a horse preserve.

*Special Designations.* Existing and newly designated ACECs totaling approximately 351,400 acres would be withdrawn from surface entry.

**Conclusion.** Approximately 95,677 acres would be identified as available for possible disposal and approximately 71,999 acres would be withdrawn. Watershed analyses and subsequent restoration plans would identify lands to be retained as critical habitat for threatened or endangered species. Withdrawing these sensitive and high resource value areas from surface and mineral entry would serve to reduce the amount of land available for possible disposal as compared to Alternative A, but the removal of requirements pertaining to the retention of big game habitat, upland game habitat and wild horse herd management areas would allow more flexibility in conducting lands and realty actions.





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**Goal 2 – Meet public needs for use authorizations such as rights-of-way, permits, leases, and easements while avoiding or minimizing adverse impacts to other resource values.**

### Alternative A

**Impacts from Lands and Realty Management Direction.** Under Alternative A, management direction would allow flexibility in land use authorizations while encouraging co-location of facilities. By not identifying new corridors or communication sites, the location of future rights-of-way and communication sites would not be addressed proactively and could take longer to occur by being addressed on a case-by-case basis under site-specific NEPA analyses.

### **Impacts from Other Programs.**

*Vegetation, Fish and Wildlife, Special Status Species, Wild Horses, Cultural Resources, Visual Resources, Renewable Energy, Recreation, Livestock Grazing, and Geology and Mineral Extraction.* Land use authorizations would be evaluated on a case-by-case basis under site-specific NEPA analysis for conflicts with other applicable resources. These evaluations would determine if granting the authorizations would be appropriate based on impacts to resources. If granted, standard operating procedures, as applicable, would be required of the operator to minimize potential impacts.

*Special Designations.* Existing land use authorization avoidance areas identified in Section 2.5.22 would continue to be implemented under this alternative.

**Conclusion.** Alternative A allows flexibility in land use authorizations while encouraging co-location of facilities. By not identifying new communication sites or 0.5-mile wide corridors, the location of future rights-of-way and communication sites would not be addressed proactively and could take longer to occur by being addressed on a case-by-case basis under site-specific NEPA analyses.

### Alternative B

**Impacts from Lands and Realty Management Direction.** Under Alternative B, management direction would allow a degree of flexibility in land use authorizations, while requiring co-location of facilities, to a greater extent than Alternative A. The proactive identification of new corridors and communication sites would allow more flexibility and timeliness in addressing future land use authorization needs.

**Impacts from Other Programs.** The following interrelated programs would result in different impacts compared to Alternative A.

*Fish and Wildlife, Special Status Species, Vegetation, Wild Horses, Cultural Resources, Visual Resources, Renewable Energy, Recreation, Livestock Grazing, and Geology and Mineral Extraction.* Land use authorizations would be evaluated on a case-by-case basis for conflicts with other applicable resources to determine if granting the authorizations would be appropriate based on impacts to resources. Specific actions may be limited, centralized, or prohibited based on restoration efforts and other resource objectives.



*Special Designations.* Under Alternative B, approximately 147,400 additional acres would be designated as ACECs. Special designation areas would be land use authorization avoidance areas under this alternative. Special designation areas under Alternative B are identified in Section 2.5-22.

**Conclusion.** Alternative B would allow a degree of flexibility in land use authorizations while requiring co-location of facilities to a greater extent. The proactive identification of new 0.5-mile wide corridors and communication sites would allow more flexibility and timeliness in addressing future land use authorization needs.

### **Alternative C**

**Impacts from Lands and Realty Management Direction.** Under Alternative C, management direction would allow a degree of flexibility in land use authorizations while encouraging co-location of facilities. The proactive identification of new corridors and communication sites would allow more flexibility and timeliness in addressing future land use authorization needs. Presumably, the greater width of designated utility corridors (3 miles wide) would allow for co-location of more rights-of-way within utility corridors.

**Impacts from Other Programs.** Lands and realty impacts associated with fish and wildlife and special status species management activities would be the same as described for Alternative A. Lands and realty impacts associated with vegetation, wild horses, cultural resources, visual resources, renewable energy, recreation, livestock grazing, and mineral extraction would be the same as described for Alternative B. The following interrelated programs would result in different impacts compared to Alternatives A and B.

*Special Designations.* Under Alternative C, approximately 142,800 additional acres would be designated as ACECs. Special designation areas would be land use authorization avoidance areas under this alternative. Special designation areas under Alternative C are detailed in Section 2.5.22.

**Conclusion.** Alternative C would allow a degree of flexibility in land use authorizations while encouraging co-location of facilities. The proactive identification of new corridors and communication sites would allow more flexibility and timeliness in addressing future land use authorization needs. Presumably, the 3-mile width of designated utility corridors would allow for co-location of more rights-of-way within utility corridors.

### **Alternative D**

**Impacts from Lands and Realty Management Direction.** Under Alternative D, the absence of new land use authorizations would greatly restrict lands actions such as designating rights-of-way. The possible elimination of existing communication sites would further reduce the ability to address future needs.

**Impacts from Other Programs.** Lands and realty impacts associated with vegetation, special status species, wild horses, cultural resources, renewable energy, recreation, livestock grazing, and geology and mineral extraction management activities would be the same as described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.



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*Fish and Wildlife.* Migratory bird corridors would be identified and these areas closed to any communication or energy tower siting.

*Visual Resources.* Visually sensitive sites would be withdrawn from communication site development.

*Special Designations.* Under Alternative D, all special designations would be eliminated as unnecessary since no new land use authorizations would be granted.

**Conclusion.** Limitations on new land use authorizations, and the closure of sites within migratory bird corridors and visually sensitive sites would greatly restrict lands and realty actions in Alternative D. The possible elimination of existing communication sites would further reduce the ability of the lands and realty program to address future needs.

### Alternative E

**Impacts from Lands and Realty Management Direction.** Alternative E would allow a degree of flexibility in land use authorizations while encouraging co-location of facilities. The proactive identification of new 0.5-mile-wide corridors and communication sites would allow more flexibility and timeliness in addressing future land use authorization needs.

**Impacts from Other Programs.** Lands and realty impacts associated with fish and wildlife and special status species management activities would be the same as described for Alternative A. Impacts associated with vegetation, wild horses, cultural resources, visual resources, renewable energy, recreation, livestock grazing, and geology and mineral extraction management activities would be similar to those described for Alternative B.

*Special Designations.* Under Alternative E, approximately 138,900 additional acres would be designated as ACECs. Special designation areas would be land use authorization avoidance areas under this alternative. Special designation areas under Alternative E are detailed in Section 2.5.22.

**Conclusion.** Alternative E would allow a degree of flexibility in land use authorizations while encouraging co-location of facilities. The proactive identification of new 0.5-mile-wide corridors and communication sites would allow more flexibility and timeliness in address future land use authorization needs.



## 4.13 Renewable Energy

### Impact Issues

The primary impact issues associated with renewable energy are a direct result of interactions with other resource programs that would restrict renewable energy development. Areas that are suitable for renewable energy development are limited to those areas where these resources occur. Thus, conflicts with other resources would have the potential to reduce areas deemed suitable for development. Authorization of renewable energy projects would be evaluated using an interdisciplinary approach, and site-specific NEPA analysis would occur for all renewable energy development projects.

### Assumptions for Analysis

- Identification of areas as having high potential for renewable energy does not mean these lands would be developed.

### Interactions with Other Programs

The renewable energy management program within the Ely District potentially would be affected by actions within the resource management programs for fish and wildlife, special status species, cultural resources, visual resources, lands and realty, geology and mineral extraction, and special designations.

**Goal – Provide opportunities for development of renewable energy sources such as wind, solar, biomass, and other alternative energy sources while minimizing adverse impacts to other resources such as wildlife and visual resources.**

### Alternative A

**Impacts from Renewable Energy Management Direction.** Under Alternative A, renewable energy development would be authorized on a case-by-case basis. Authorizations would be granted for renewable energy projects using an interdisciplinary approach, which would evaluate the impacts of proposed projects on interrelated resource programs.

### **Impacts from Other Programs.**

*Fish and Wildlife.* Renewable energy projects would be required to implement measures to reduce raptor collision potential on new and existing powerlines. Additionally, renewable energy siting and associated transmission lines would be encouraged to use existing utility corridors to minimize habitat fragmentation.

*Special Status Species, Cultural Resources, Visual Resources, Lands and Realty, Geology and Mineral Extraction, and Special Designations.* Renewable energy projects would be evaluated on a



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case-by-case basis for conflicts with resources to determine if granting the authorizations would be appropriate based on impacts to resources.

*Lands and Realty.* Renewable energy projects such as concentrated solar power development could be impacted by land use authorizations for power plants, disposals of lands resulting in residential developments, and other lands and realty actions resulting in increased consumptive use of water resources. Approximately 28,531 acres are identified for possible disposal.

**Conclusion.** The current management policy of evaluating and authorizing renewable energy projects on a case-by-case basis does not provide the opportunity to develop management strategies for anticipated future conditions nor a consistent approach to issuing land use authorizations. It also would not prevent the preemptive use of water resources that could be used for renewable energy, thereby potentially reducing renewable energy development.

### Alternative B

**Impacts from Renewable Energy Management Direction.** Under Alternative B, areas of potential renewable energy development (wind and solar) are identified, though potential development would not be restricted to those areas. Under Alternative B, approximately 201,000 acres of potential wind development areas, and approximately 6.77 million acres of potential solar development areas are identified. Authorizations would be granted for renewable energy projects using an interdisciplinary approach, which would evaluate the impacts of proposed projects on interrelated resource programs. Resource conflicts identified within the high potential areas during the review process potentially would reduce the areas available for renewable energy development if conflicts could not be mitigated.

**Impacts from Other Programs.** Renewable energy impacts associated with fish and wildlife, special status species, cultural resources, visual resources, geology and mineral extraction, and special designations management activities would be the same as described for Alternative A.

*Lands and Realty.* Renewable energy projects such as concentrated solar power development could be impacted by land use authorizations for power plants, disposals of lands resulting in residential developments, and other lands and realty actions resulting in increased consumptive use of water resources. Approximately 87,834 acres would be identified for possible disposal.

**Conclusion.** Identification of areas of high potential for renewable energy development may help to facilitate wind and solar energy development. Approximately 201,000 acres of potential wind development areas and approximately 6.77 million acres of potential solar development areas are identified. The management direction would address issues as they arise, but would not provide the opportunity to develop management strategies for anticipated future conditions. It also would not prevent the preemptive use of water resources that could be used for renewable energy, thereby potentially reducing renewable energy development.



### Alternative C

**Impacts from Renewable Energy Management Direction.** Impacts to renewable energy associated with program-specific management activities would be similar to those under Alternative B except approximately 203,000 acres would be identified as potential wind energy development areas and 6.77 million acres would be identified as potential solar energy development areas under Alternative C, though potential development would not be restricted to those areas.

**Impacts from Other Programs.** Renewable energy impacts associated with fish and wildlife, special status species, cultural resources, visual resources, geology and mineral extraction, and special designations management activities would be the same as described for Alternative A.

*Lands and Realty.* Renewable energy projects such as concentrated solar power development could be impacted by land use authorizations for power plants, disposals of lands resulting in residential developments, and other lands and realty actions resulting in increased consumptive use of water resources. Approximately 288,744 acres are identified for possible disposal.

**Conclusion.** Identification of areas of high potential for renewable energy development may help to facilitate wind and solar energy development. Approximately 203,000 acres of potential wind development areas and approximately 6.77 million acres of potential solar development areas are identified. The management direction would address issues as they arise, but would not provide the opportunity to develop management strategies for anticipated future conditions. It also would not prevent the preemptive use of water resources that could be used for renewable energy, thereby potentially reducing renewable energy development.

### Alternative D

**Impacts from Renewable Energy Management Direction.** The effects to renewable energy associated with program-specific management activities under this alternative would be the same as described for Alternative A.

**Impacts from Other Programs.** Renewable energy impacts associated with fish and wildlife, special status species, cultural resources, visual resources, geology and mineral extraction, and special designations management activities would be the same as described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Lands and Realty.* Management under the lands and realty program would have a large impact on renewable energy. There would be no new land use authorizations which would severely restrict the development of renewable energy projects.

**Conclusion.** Under Alternative D, renewable energy development would be severely restricted through the prohibition on new land use authorizations.



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### Alternative E

**Impacts from Renewable Energy Management Direction.** Impacts to renewable energy associated with program-specific management activities would be similar to those described for Alternative C.

**Impacts from Other Programs.** Renewable energy impacts associated with fish and wildlife, special status species, cultural resources, visual resources, geology and mineral extraction, and special designation management activities would be similar to those described for Alternative A.

*Lands and Realty.* Renewable energy projects such as concentrated solar power development could be impacted by land use authorizations for power plants, disposals of lands resulting in residential developments, and other lands and realty actions resulting in increased consumptive use of water resources. Approximately 95,677 acres are identified for possible disposal.

**Conclusion.** Identification of areas of high potential for renewable energy development may help to facilitate wind and solar energy development. Approximately 205,000 acres of potential wind development areas and approximately 6.77 million acres of potential solar development areas are identified. The management direction would address issues as they arise, but would not provide the opportunity to develop management strategies for anticipated future conditions. It also would not prevent the preemptive use of water resources that could be used for renewable energy, thereby potentially reducing renewable energy development.



### 4.14 Travel Management and Off-highway Vehicle Use

#### Impact Issues

The primary impact issues associated with transportation is accessibility throughout the District and the proliferation of roads developed through use. Additionally, the use of motorized vehicles on public lands is increasing for recreation as well as for personal transportation.

#### Assumptions for Analysis

- The demand for off-highway vehicle use on the District would continue to increase over time.

#### Interactions with Other Programs

The travel management and off-highway vehicle use management program within the Ely District potentially would be affected by actions within the resource management programs for fish and wildlife, special status species, lands and realty, renewable energy, recreation, geology and mineral extraction, watershed management, and special designations.

**Goal – Provide and maintain suitable access to public lands. Manage off-highway vehicle use to protect resource values, promote public safety, provide off-highway vehicle opportunities where appropriate, and minimize conflict.**

#### Alternative A

**Impacts from Travel Management and Off-highway Vehicle Use Management Direction.** Under Alternative A, motorized vehicle use, including off-highway vehicle use, would be managed in accordance with the current open, limited, and closed designations, allowing cross-country off-highway vehicle use throughout most of the district.

#### **Impacts from Other Programs.**

*Fish and Wildlife.* Fish and wildlife management would have minimal impact on transportation. Wildlife habitat projects performed in a case-by-case basis could result in some reduction in access.

*Special Status Species.* Special status species management under Alternative A would have limited impacts on transportation management. As wildlife personnel coordinate with the appropriate agencies to identify roads and trails with high desert tortoise mortality due to vehicle traffic, there is the potential for installation of safeguards such as fencing along roadsides to keep the desert tortoise off the road. The installation of controls such as fencing would limit the access of off-highway vehicle users to these roads in the limited areas where such measures are implemented.



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*Lands and Realty.* Management under the lands and realty program would minimally impact transportation. The potential disposal and leasing of lands currently containing off-highway vehicle opportunities potentially would occur, reducing off-highway vehicle opportunities and increasing the potential of user conflicts on adjacent lands. However, based on the small amount of land that would be impacted and the retention of easements for existing roads and trails, it is anticipated that impacts to transportation would be minimal.

*Renewable Energy.* Renewable energy management would have impacts on transportation similar to minerals, oil, gas, and geothermal development. There is the potential for increased road use and the construction of new access roads as renewable energy sites are developed. The areas of high wind potential tend to be located on top of ridge lines which would have little impact on existing transportation due to the lack of roads in these areas. Based on the comparatively small acreage of high potential areas within the District, it is anticipated that impacts on transportation would be minimal.

*Recreation.* Recreation management would have minimal impacts on transportation. Under Alternative A, the greatest acreage of public land would be open to off-highway vehicle use, which would provide substantial recreation opportunity. However, this large amount of open land also would increase the potential for conflict between off-highway vehicle users and other types of recreation users. It is anticipated that these conflicts would be minimal based on the large amount of land available for recreation.

*Mineral Extraction.* Management actions relating to minerals, oil, gas, and geothermal development would have minimal impacts on transportation. Although there is the potential for increased road use as well as the construction of new access roads, based on the total acreage of potential development under Alternative A, transportation would not be substantially impacted by these actions.

*Watershed Management.* Watershed management would have the potential to minimally impact transportation. As watershed analysis occurs under Alternative A, there is the possibility that closures to motorized vehicles would be required to supplement restoration activities. However, it is anticipated that any closures would be minimal under Alternative A.

*Special Designations.* Designated wilderness would continue to be closed to vehicle use. Vehicle use within all Wilderness Study Areas would be limited to designated roads and trail. The three existing ACECs would be designated as limited for casual off-highway vehicle use and closed to organized off-highway vehicle use. The remainder of the planning area would be designated as open. Alternative A would provide the most off-road access of all alternatives considered. However, Alternative A also would pose the highest likelihood of potential conflict between off-highway vehicle users and other resource users.

**Conclusion.** The current management program addresses issues as they arise and on a case-by-case basis. Continuation of an open designation for the majority of the District provides for the greatest accessibility but would result in increased conflict between other resource users and off-highway vehicle users over time.



##### Alternative B

**Impacts from Travel Management and Off-highway Vehicle Use Management Direction.** Under Alternative B, transportation on the District would be primarily limited to designated roads and trails. Updating the road and trail designations on a watershed basis would allow for improved accessibility in the long term with some reduction in accessibility in the short term.

**Impacts from Other Programs.** Travel management and off-highway vehicle use resource impacts associated with fish and wildlife, special status species, lands and realty, renewable energy, and geology and mineral extraction management activities would be similar to those described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Recreation.* Recreation management would have minimal impacts on the transportation program. Under Alternative B, recreation management would focus on providing dispersed recreation opportunities with an emphasis on resource protection. The creation of three portions of two special recreation management areas that emphasize motorized recreation, totaling 310,000 acres, would help to offset the elimination of areas open to cross-country off-highway vehicle use. The management within the designated special recreation management areas would focus on a variety of recreation opportunities, which potentially would create conflicts with off-highway vehicle users. However, because all types of recreation would be considered in recreation area management plans developed for each special recreation management area, including off-highway vehicle use, it is likely that conflicts with off-highway vehicle users would be minimal.

*Watershed Management.* Under Alternative B, the watershed program management would have impacts on transportation similar to those discussed under Alternative A. However, a more aggressive vegetation treatment schedule potentially would lead to accelerated closures as compared to Alternative A.

*Special Designations.* Alternative B would close all designated wildemess and Wilderness Study Areas to off-highway vehicle use. The addition of a back country byway would increase access locally. Overall, special designations under Alternative B would decrease access by motorized vehicles compared to Alternative A.

**Conclusion.** Alternative B would have proactive management and maintenance of the roads and trails in the District. As the existing road system is evaluated on a watershed basis, roads potentially would be closed or limited. Overall, this management could decrease access by motorized vehicles in the short term and possibly in the long term depending on whether or not roads were permanently closed. Off-highway vehicle use opportunities would be impacted through the elimination of areas open to cross-country off-highway vehicle use.

##### Alternative C

**Impacts from Travel Management and Off-highway Vehicle Use Management Direction.** Under Alternative C, transportation on the District would be primarily limited to designated roads and trails.



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Updating the road and trail designations on a watershed basis would allow for improved accessibility in the long term with some reduction in accessibility in the short term.

**Impacts from Other Programs.** Travel management and off-highway vehicle use resource impacts associated with fish and wildlife, special status species, lands and realty, renewable energy, and geology and mineral extraction management activities would be the same as described for Alternative A. Travel management and off-highway vehicle use resource impacts associated with watershed management activities would be the same as described for Alternative B. The following interrelated programs would result in different impacts compared to Alternatives A and B.

*Recreation.* Recreation management would have minimal impacts on the transportation program. The creation of five portions of four special recreation management areas that emphasize motorized recreation, totaling 734,000 acres, would help to offset the elimination of areas open to cross-country off-highway vehicle use. The focus on increasing recreation under this management program potentially would create increased conflicts with off-highway vehicle users. However, because all types of recreation would be considered in recreation area management plans developed for each special recreation management area, including off-highway vehicle use, it is likely that conflicts with off-highway vehicle users would be minimal. A District-wide off-highway vehicle trail system would be established based on the Lincoln County Trails Coalition Silver State Trail proposal. This trail system would designate off-highway vehicle access points around gateway communities, improving access to off-highway vehicle opportunities.

*Special Designations.* The management of special designations would have minimal impact on travel management and off-highway vehicle use. The addition of two new back country byways would increase access locally.

**Conclusion.** Alternative C would have proactive management and maintenance of the roads and trails in the District. As the existing road system is evaluated on a watershed basis, roads potentially would be closed or limited. Overall, this management could decrease access by motorized vehicles in the short term and possibly in the long term depending on whether or not roads were permanently closed. Off-highway vehicle use opportunities would be impacted through the reduction of areas open to cross-country off-highway vehicle use to approximately 32,000 acres.

### Alternative D

**Impacts from Travel Management and Off-highway Vehicle Use Management Direction.** Motorized travel would be limited to roads currently in the transportation plan. Management under this alternative would greatly restrict the ability to address future needs for accessibility.

**Impacts from Other Programs.** Travel management and off-highway vehicle use resource impacts associated with fish and wildlife, special status species, renewable energy, geology and mineral extraction, and watershed management activities would be similar to those described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.



*Lands and Realty.* Under Alternative D, no new rights-of-way would be designated. This could limit transportation in the long term.

*Recreation.* Under Alternative D, all motorized vehicles would be limited to existing designated roads and trails, and no special recreation management areas that emphasize motorized recreation would be identified. This would further limit off-highway vehicle use opportunities and transportation in the short and long term.

*Special Designations.* Recreation management would have minimal impacts on the transportation program. Under Alternative D, all off-highway vehicle use would be limited to designated roads and trails, and no special recreation management areas that emphasize motorized recreation would be identified. This would further limit off-highway vehicle use opportunities.

**Conclusion.** Alternative D would substantially restrict motorized travel in the District in the short and long term. The lack of new land authorizations would reduce accessibility in the long term.

#### **Alternative E**

**Impacts from Travel Management and Off-highway Vehicle Use Management Direction.** Under Alternative E, travel designation areas would be similar to those for Alternative B. Updating the road and trail designations on a watershed basis would allow for improved accessibility in the long term with some reduction in accessibility in the short term.

**Impacts from Other Programs.** Under Alternative E, travel management and off-highway vehicle use resource impacts associated with fish and wildlife, special status species, lands and realty, renewable energy, and geology and mineral extraction management activities would be similar to Alternative A. The effects associated with watershed management activities would be similar to Alternative B. The effects associated with recreation and special designation management activities would be similar to Alternative C.

**Conclusion.** The elimination of cross-country off-highway vehicle use and the prioritization of road and trail designations through an updated transportation plan would have short- and long-term impacts to travel management, but would reduce off-highway vehicle use opportunities. The designation of 734,000 acres emphasizing motorized recreation on designated roads and trails within special recreation management areas would help to offset the elimination of areas open to cross-country off-highway vehicle use.







## 4.15 Recreation

### Impact Issues

The primary impact issue associated with recreation is related to conflicts with other resource programs. As recreation use in the District increases, it is anticipated that recreational activities would have an increasing potential for conflicts with other resources.

### Assumptions for Analysis

- Recreation use on the District would continue to increase over time.
- Establishing special recreation management areas does not imply that recreation would increase in these areas, or that recreation would be limited to these areas.

### Interactions with Other Programs

The recreation management program within the Ely District potentially would be affected by actions within the resource management programs for vegetation, fish and wildlife, special status species, wild horses, cultural resources, paleontological resources, lands and realty, renewable energy, travel management and off-highway vehicle use, geology and mineral extraction, watershed management, noxious and invasive weed management, and special designations.

**Goal – Provide quality settings for developed and undeveloped recreation experiences and opportunities while protecting resources.**

### Alternative A

**Impacts from Recreation Management Direction.** Under Alternative A, management of the existing Loneliest Highway Special Recreation Management Area and the Schell, Egan, and Caliente extensive recreation management areas would continue. Recreation area management plans would be developed for specific areas on an as-needed basis as determined by BLM staff. Management of cave resources would be based on the Ely District Cave Management Plan (BLM 1986). A management plan would be developed for rock climbing and bouldering on the District. Outfitter and guide services and off-highway vehicle race events would continue to be managed under special recreation permits according to the Ely Field Office Special Recreation Permit Policy of 2001, BLM handbook H-8372-2, and 43 Code of Federal Regulations subpart 8372. Outfitting and guide permits would continue to be issued on a first-come, first-served basis. While this alternative allows some proactive management actions, it does not address a broad spectrum of activities throughout the district.

As recreation use continues to increase over time, the limited number of recreation sites eventually would lead to increased competition for recreation opportunities. With only one special recreation management



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area on the District and no further creation of developed recreation sites, the ability to manage recreation as a primary objective in areas with high recreation potential would be constrained.

### Impacts from Other Programs.

*Vegetation.* Management of vegetation resources would have minimal impacts on recreation. However, impacts to recreation would occur due to enhanced aesthetics through programs such as reducing competition in aspen stands and vegetation management to enhance habitat in the long term.

*Fish and Wildlife.* Recreation would not be impacted by management activities within the fish and wildlife program under Alternative A.

*Special Status Species.* Management actions initiated to protect special status species and associated habitat, especially sage grouse and desert tortoise, may lead to road and trail closures, limiting motorized access for dispersed recreation activities such as hunting.

*Wild Horses.* Management of wild horses would have minimal impacts on recreation. Wild horses would continue to be managed in 24 herd management areas covering approximately 5.36 million acres.

*Cultural Resources.* Alternative A is primarily a program of monitoring of selected sites and managing for future cultural resource use allocations. Restrictions to access of areas containing significant cultural resources, such as cave restrictions or closures, would restrict access for recreational activities. However, opportunities for cultural resource interpretation would result in increased interpretive recreation opportunities.

*Paleontological Resources.* Management of paleontological resources under Alternative A would have minimal impacts on recreation. No registration system would be in place for trilobite collecting.

*Lands and Realty.* Management under the lands and realty program would minimally impact recreation through the possible disposal and leasing of lands containing recreation opportunities. However, based on the small amount of land that would be impacted, it is anticipated that impacts to recreation would be minimal.

*Renewable Energy.* Renewable energy management could have localized impacts on recreation. Applications for renewable energy development would be processed on a case-by-case basis.

*Travel Management and Off-highway Vehicle Use.* Under Alternative A, the greatest amount of land would be designated as open to off-highway vehicle use. Only the designated wilderness would be closed to vehicle use, while vehicle use would be limited to designated roads and trails in all Wilderness Study Areas and within the Desert Tortoise Amendment area. The remainder of the area would be designated as open to off-highway vehicle use. This would continue to provide a substantial recreation opportunity for recreational off-highway vehicle use, as well as hunting and other types of recreation activities that would use



off-highway vehicles as a transportation method. However, Alternative A also would pose the highest likelihood of potential conflict between off-highway vehicle users and other resource users.

**Mineral Extraction.** Management actions relating to minerals, oil, gas, and geothermal development would have minimal impacts on recreation. Based on the total acreage of potential mineral development under Alternative A, recreation would not be substantially impacted by these actions.



**Watershed Management.** As watershed analysis occurs under Alternative A, there is the possibility that closures to motorized vehicles would be required to supplement restoration activities, thereby limiting access to some areas. However, it is anticipated that any closures would be minimal under Alternative A. As a result, it is anticipated that recreation impacts associated with watershed management activities would be minimal.

**Noxious and Invasive Weed Management.** Management of noxious and invasive weeds would have minimal impacts on recreation.

**Special Designations.** Under Alternative A, special designations impacts would continue as under the current management program since no new special designations would be proposed. Currently, 212,500 acres designated as ACECs would be retained under Alternative A. These three existing ACECs would continue to be designated as limited for casual off-highway vehicle use and general recreation, and closed to organized off-highway vehicle use. The special designations under Alternative A make available the greatest amount of land for off-highway vehicle use, but there is an increased potential for conflict between off-highway vehicle users and other recreational users as a result. Designated wilderness areas would be closed to vehicles, and all Wilderness Study Areas and ACECs would limit off-highway vehicles to designated roads and trails. The rest of the planning area would remain designated as open to off-highway vehicle use.

**Conclusion.** As recreation use continues to increase over time, the limited number of recreation sites eventually would lead to increased competition for recreation opportunities. With only one special recreation management area on the District and no further creation of developed recreation sites, the ability to manage recreation as a primary objective in areas with high recreation potential would be constrained.



### Alternative B

**Impacts from Recreation Management Direction.** Under Alternative B, nine special recreation management areas totaling approximately 2.68 million acres would be designated. Two special recreation permit areas totaling approximately 656,000 acres for motorcycle races would be established across the District. The overall impact of the management direction would be to focus activities in areas that would be managed for their sustainable use. This alternative designates more special recreation areas, allows more proactive management actions than Alternative A, and addresses a broader spectrum of activities throughout the district.

**Impacts from Other Programs.** Recreation resource impacts associated with renewable energy and noxious and invasive weed management activities would be similar to those described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Vegetation.* Under Alternative B the areas affected by vegetation treatments would be more than Alternative A, as the use of prescribed fire and managed natural fire would be maximized under this alternative. This would result in reduced access for recreation during the short term after the treatment.

*Fish and Wildlife.* Fish and wildlife management under Alternative B would provide impacts to recreation as the implementation of wildlife introduction and re-introduction programs would enhance aesthetics and increase wildlife viewing opportunities by increasing species distribution and diversity. Additionally, re-introduction of big game species would enhance hunting activities.

*Special Status Species.* Special status species management under Alternative B would be similar to Alternative A. The special recreation management areas also contain approximately 43 known sage grouse leks. Management for these species could limit some recreational activities.

*Wild Horses.* Management of wild horses would reduce recreation opportunities for viewing wild horses. Wild horses would be managed in six herd management areas covering approximately 1.76 million acres less than under Alternative A.

*Cultural Resources.* Alternative B emphasizes the restoration of at-risk resources. As conservation is emphasized in this approach, it is anticipated that this alternative would place the greatest restriction on public access and recreation at cultural resource sites. Those sites designated for conservation use might need to be specially managed if located within a special recreation management area. Overall, the treatment of cultural resources under Alternative B would have minimal impact to recreation, as compared to Alternative A.

*Paleontological Resources.* Management of paleontological resources under Alternative B would have minor impacts on recreation through the implementation of a no-fee registration system established for trilobite collecting. This could reduce recreational trilobite collection due to inconvenience and potential difficulty associated with registration.



*Lands and Realty.* Under Alternative B, management under the lands and realty program would minimally impact recreation through the possible disposal and leasing of lands containing recreation opportunities. Under Alternative B, approximately 4,648 acres of land would be available for potential disposal within the nine special recreation management areas. However, based on the acreage of land that would be affected, it is anticipated that impacts to recreation would be minimal. Approximately 17,651 acres of land are identified for possible disposal within motorcycle special recreation permit areas. Disposal of this land would reduce the amount of land available for motorcycle races from the 310,000 acres identified under this alternative.

*Travel Management and Off-highway Vehicle Use.* Under Alternative B, approximately 1.06 million acres (designated wilderness and Wilderness Study Areas) would be closed to off-highway vehicle use. The remaining areas would be limited to designated roads and trails. Additionally, as the existing road system is evaluated on a watershed basis, roads potentially would be closed or limited. Overall, travel management under Alternative B would decrease recreation opportunities involving motorized vehicles, compared to Alternative A. However, these transportation restrictions also would provide an increased opportunity for seclusion and primitive recreational opportunities.

*Mineral Extraction.* Under Alternative B, management actions relating to minerals, oil, gas, and geothermal development would have minimal impacts on recreation. Based on the reasonably foreseeable development projection, approximately 15,600 acres would be disturbed. Of the open areas with high mineral potential, approximately 1.0 million acres are within special recreation management areas.

*Watershed Management.* Watershed management would have the potential to minimally impact recreation. As watershed analysis occurs under Alternative B, there is the possibility that closures to motorized vehicles would be required to supplement restoration activities, limiting access to some areas as discussed under Alternative A. However, a more aggressive watershed analysis schedule potentially would lead to accelerated closures as compared to Alternative A. This could lead to a reduction in recreational opportunities requiring motorized vehicles and an increased opportunity for seclusion and primitive recreation opportunities.

*Special Designations.* Under Alternative B, 18 new ACECs and one new Back Country Byway would be designated. Four of these ACECs would be reclassifications of former archaeological sites, while one would be a reclassification of a former historic area. Additionally, two areas would be removed from designation as scenic areas due to their not meeting the criteria for such designation; recreation impacts from this change in designation are anticipated to be minimal. Alternative B would designate all designated wilderness and Wilderness Study Areas closed to off-highway vehicle use, impacting recreation activities that use off-highway vehicle use as a method of transportation. Off-highway vehicle use would be limited to designated roads and trails in the 18 new ACECs. The three existing ACECs would be designated as limited for casual off-highway vehicle use and general recreation, and closed to organized off-highway vehicle use. Overall, the treatment of special designations under Alternative B would decrease recreation opportunities requiring motorized vehicles, compared to Alternative A. However, these transportation restrictions also would provide an increased opportunity for seclusion and primitive recreational opportunities.



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**Conclusion.** Alternative B would constitute a comprehensive program that addresses the trend of increasing recreational use as well as providing the opportunity to develop management strategies for anticipated future conditions. Nine special recreation management areas totaling approximately 2.68 million acres would be designated. Elimination of areas designated as open to cross-country off-highway vehicle use could reduce motorized recreational opportunities.

### Alternative C

**Impacts from Recreation Management Direction.** Under Alternative C, ten special recreation management areas totaling approximately 3.31 million acres would be designated. Two special recreation permit areas totaling approximately 1.36 million acres for motorcycle races would be established across the District. The overall impact of the management direction would be to focus activities in areas that would be managed for their sustainable use. This alternative designates more special recreation areas and allows more proactive management actions than Alternative A, and addresses a broader spectrum of activities throughout the District.

**Impacts from Other Programs.** Recreation resource impacts associated with renewable energy and noxious and invasive weed management activities would be similar to those described for Alternative A. Impacts associated with wild horses, and watershed management activities would be the same as described for Alternative B. The following interrelated programs would result in different impacts compared to Alternatives A and B.

*Fish and Wildlife.* Managing fish and wildlife to enhance and restore game species would create more recreational opportunities for fishing and hunting as compared to Alternative A.

*Vegetation.* The use of prescribed fire and managed natural fire would be minimized under this alternative, resulting in greater potential access for recreation during the short term after vegetation treatments than under Alternative A.

*Special Status Species.* Special status species management under Alternative C would be similar to Alternative A. The special recreation management areas also contain approximately 50 known sage grouse leks. Management for these species could limit some recreational activities.

*Cultural Resources.* Alternative C emphasizes responsible commercial activities. Fee sites would be implemented to cover the cost of public site management for several types of cultural sites open to public use. If no fee sites are established for these types of sites, there would be no public use of the sites and they would be designated for conservation or scientific use. Those sites designated for conservation use might impact areas designated for developed recreation. Overall, the treatment of cultural resources under Alternative C could have the impact of reducing access to recreation, as compared to Alternative A.

*Paleontological Resources.* Management of paleontological resources under Alternative C could have minor impacts on recreation. A fee-based registration system would be established for trilobite collecting. This could reduce recreational trilobite collection due to inconvenience and cost of obtaining a permit.



*Lands and Realty.* Under Alternative C, impacts to recreation management from the lands and realty program would be similar to Alternative A. Under Alternative C, approximately 61,526 acres of land would be available for potential disposal that are within the 10 special recreation management areas that would be designated. However, based on the acreage of land that would be affected, it is anticipated that impacts to recreation under this alternative would be minimal. Approximately 102,442 acres of land are identified for possible disposal within motorcycle special recreation permit areas. Disposal of this land would reduce the amount of land available for motorcycle races from the 734,000 acres identified under this alternative.

*Travel Management and Off-highway Vehicle Use.* Under Alternative C, approximately 32,000 acres would be designated as open to cross-country off-highway vehicle use in dry lake beds. Designated wilderness would be closed to off-highway vehicles. The three existing ACECs would be designated as limited for casual off-highway vehicle use and general recreation, and closed to organized off-highway vehicle use. The remaining areas would be designated as limited to designated roads and trails. As part of the District-wide implementation of a trail system under Alternative C, trail access points would be established adjacent to gateway communities in an effort to maximize tourism and economic gain to these communities. Additionally, as the existing road system is evaluated on a watershed basis, roads potentially would be closed or limited. Overall, travel management under Alternative C would decrease recreation opportunities requiring motorized vehicles compared to Alternative A. However, these transportation restrictions also would provide an increased opportunity for seclusion and primitive recreational opportunities. The establishment of trail access points would result in additional access for recreation.

*Mineral Extraction.* Under Alternative C, management actions relating to minerals, oil, gas, and geothermal development would have minimal impacts on recreation, based on the reasonably foreseeable development projection of approximately 15,600 acres of potential development. Of the open areas within high mineral potential, approximately 1.3 million acres are within special recreation management areas.

*Special Designations.* Under Alternative C, 20 new ACECs and two new back country byways would be designated. Four of the ACECs would be reclassifications of former archaeological sites, while one would be a reclassification of a former historic area. Additionally, two areas would be removed from designation as scenic areas due to their inability to meet the criteria for such designation; impacts from this change in designation are anticipated to be minimal. The designated wilderness would be closed to off-highway vehicles. The three existing ACECs would be designated as limited for casual off-highway vehicle use and general recreation, and closed to organized off-highway vehicle use. Off-highway vehicle use would be limited to designated roads and trails in the 20 new ACECs. The addition of two new back country byways would increase recreation opportunities. Overall, the treatment of special designations under Alternative C would decrease recreation opportunities requiring motorized vehicles, compared to Alternative A. However, these restrictions also would provide an increased opportunity for seclusion and primitive recreational opportunities.

**Conclusion.** Alternative C would constitute a comprehensive program that would address the trend of increasing recreational use as well as providing the opportunity to develop management strategies for anticipated future conditions. Ten special recreation management areas totaling approximately 3.31 million



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acres would be designated. Reduction of areas designated as open to cross-country off-highway vehicle use could reduce motorized recreational opportunities.

### Alternative D

**Impacts from Recreation Management Direction.** The overall effect of management under this alternative is a large reduction in recreation opportunities across a broad spectrum. Under Alternative D, all special recreation management areas and existing developed sites would be eliminated. Cave resources would be managed similar to under Alternative A. Rock climbing and bouldering activities would be managed as discussed under Alternative A. Outfitter and guide permits would no longer be issued under Alternative D. This would eliminate outfitter/guide-supported hunting, but would not affect self-supported hunting. No special recreation permit areas would be established for motorcycle events. With a decrease in areas available in Clark County for organized motorcycle events due to protection of the desert tortoise and its habitat, more races have shifted to the Ely District. The loss of special recreation permit areas in the District would further restrict opportunities for this type of motorized recreation. Participants would have to travel longer distances for races in areas where such activity is authorized. Truck events would not be permitted as discussed under Alternative A. As with motorcycle events, the elimination of truck events on the Ely District would force organizers and participants to travel to areas on public or private land where such events are still authorized.

**Impacts from Other Programs.** Recreation resource impacts associated with fish and wildlife, special status species, wild horses, cultural resources, lands and realty, renewable energy, geology and mineral extraction, watershed management, and noxious and invasive weed management activities would be the same as described in Alternative A.

*Vegetation.* Under Alternative D the areas affected by vegetation treatments would be similar to Alternative A, but areas of fire rehabilitation would likely be greater as the suppression of wildland fires would be minimized under this alternative. This would result in reduced access for recreation following treatments or catastrophic wildfires.

*Paleontological Resources.* Management of paleontological resources under Alternative D would prohibit trilobite collecting, eliminating a potential recreation opportunity.

*Travel Management and Off-highway Vehicle Use.* Management of off-highway vehicles would restrict motorized vehicles to roads currently designated in the transportation plan. This would subsequently reduce recreational opportunities in the District.

*Special Designations.* Special designations management activities would have minimal impacts on recreation. The elimination of back-country byways would potentially reduce recreation opportunities.

**Conclusion.** The spectrum of recreation opportunities would be greatly reduced under this alternative as there would be no special recreation management areas and all existing developed recreation sites would be eliminated.



## **Alternative E**

**Impacts from Recreation Management Direction.** Under Alternative E, nine special recreation management areas totaling approximately 2.68 million acres would be designated. Two special recreation permit areas for motorcycle races totaling approximately 1.36 million acres would be established across the District. The overall impact of the management direction would be to focus activities in areas that would be managed for their sustainable use. This alternative designates more special recreation areas, allows more proactive management actions than Alternative A, and addresses a broader spectrum of activities throughout the District.

**Impacts from Other Programs.** Under Alternative E, recreation resource impacts associated with renewable energy and noxious and invasive weed management activities would be similar to those described for Alternative A. Impacts to recreation associated with vegetation, fish and wildlife, special status species, wild horses, cultural resources, paleontological resources, lands and realty, travel management and off-highway vehicle use, geology and mineral extraction, and watershed management activities would be similar to those described for Alternative B.

*Lands and Realty.* Under Alternative E, management under the lands and realty program would minimally impact recreation through the possible disposal and leasing of lands containing recreation opportunities. Under Alternative E, approximately 4,648 acres of land within the nine special recreation management areas would be available for potential disposal. However, based on the acreage of land that would be affected, it is anticipated that impacts to recreation would be minimal. Approximately 39,406 acres of land are identified for possible disposal within motorcycle special recreation permit areas. Disposal of this land would reduce the amount of land available for motorcycle races from the 734,000 acres identified under this alternative.

*Special Designations.* Special designations management activities and their associated impacts on recreation would be similar to those described for Alternative B with the exception of a slightly less acreage designated for the new ACECs.

**Conclusion.** Alternative E would constitute a comprehensive program that addresses the trend of increasing recreational use as well as providing the opportunity to develop management strategies for anticipated future conditions. Nine special recreation management areas totaling approximately 2.68 million acres would be designated. Elimination of areas designated as open to cross-country off-highway vehicle use could reduce motorized recreational opportunities, while designating motorized trails could enhance recreation opportunities.







## 4.16 Livestock Grazing

### Impact Issues

Almost all of the 11.4 million acres of public land within the Ely District, with the exception of 212,500 acres within the three existing ACECs, currently are administered for multiple uses, including livestock grazing, based on decisions included in previous land use plans prepared for the Egan, Schell, and Caliente resources areas that are now administered by the Ely Field Office. Since the settlement period in the western U.S., domestic livestock grazing has been the predominant economic means for harvesting photosynthetic productivity from the public lands administered by the BLM. The BLM's grazing management of these areas involves manipulating the grazing activities by large herbivores (livestock and wild horses) so that both the plant and animal aspects will be enhanced or maintained.

Recognizing that rangeland ecological systems are dynamic and constantly adjusting to interactions with the environment, the National Research Council (1994) determined that rangelands should be placed in three broad categories based on evaluations of soil and ecological processes. They should be considered "healthy" if their capacity to satisfy values and produce commodities is being sustained. They are "at risk" if assessment of conditions suggests a reversible loss in productive capacity. Finally, they may be classified "unhealthy" when the assessment indicates that degradation has resulted in loss of capacity to provide values and commodities.

Designation of rangeland health status is based on several criteria: 1) presence and prevalence of functioning recovery mechanisms, 2) integrity of nutrient cycles and energy flows; and, 3) degree of soil stability and watershed function. Because of the integral relationships among resources, any factors or events affecting vegetation and watersheds also would affect rangeland health and livestock grazing. Impacts to livestock would generally be similar and closely related to impacts to vegetation, watersheds, and wildlife. Actions designed to have livestock grazing would be determined in some cases ahead of the watershed analysis, but also would be a part of watershed analysis.

This assessment of rangeland health is parallel to, but independent of the ecosystem health characterization discussed in Section 3.5 and Appendix D in relation to state and transition models. In the latter case, ecosystem health is based on the resistance and resiliency of the vegetation community to disturbances. Desired vegetation states and range of desired conditions are described in Chapter 2.0.

Suitability of the public lands administered by the Ely Field Office for livestock grazing is a decision addressed in previous land use plans and is not addressed in this planning document except as related to specific areas considered within individual alternatives.

### Assumptions for Analysis

- It is assumed that current market demands for livestock products would continue throughout the next several decades with a continuing demand for grazing of the public lands.



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### Interactions with Other Programs

The livestock grazing management program within the Ely District potentially would be affected by actions within the resource management programs for vegetation, fish and wildlife, special status species, wild horses, lands and realty, renewable energy, travel management and off-highway vehicle use, recreation, woodland and native plant products, geology and mineral extraction, watershed management, fire management, noxious and invasive weed management, and special designations.

**Goal – Manage the public lands to provide for a level of livestock grazing consistent with multiple use, sustained yield, and watershed function and health.**

### Alternative A

Allotment evaluations are being completed primarily in conjunction with grazing term permit renewal and the watershed analysis process. Allotment evaluations and watershed assessments are being conducted to determine if the standards and fundamentals for rangeland health are being achieved. A determination also is made as to whether livestock grazing is maintaining or progressing toward the achievement of standards for rangeland health and if livestock grazing is a significant factor in failing to achieve the standards. Standards and guidelines developed for the Ely District include the Northeastern Great Basin Area and the Mojave-Southern Great Basin Area. Standards and guidelines would be implemented through terms and conditions of grazing permits, leases and annual authorizations.

**Impacts from Livestock Grazing Management Direction.** Approximately 11.2 million acres on 235 allotments would continue to be available for livestock grazing subject to modification associated with disposal actions. As lands are disposed of, these areas would no longer be available for livestock grazing. Disposals may result in modification or elimination of individual allotments. No areas have been identified for future closure under Alternative A, but 212,500 acres would continue to be closed to livestock grazing in association with the existing Desert Tortoise Amendment.

Current livestock management actions and practices would continue under this alternative. No major changes in existing impacts are anticipated. However, impacts or changes in impacts to livestock grazing may result from stocking level reductions or changes to grazing management practices or revisions to grazing schedules and seasons of use mandated in response to a variety of factors. These could include assessment of rangeland health standards in which a determination has been made that standards are not being achieved and livestock grazing is a causal factor; restriction or exclusion of livestock to meet objectives within pastures where riparian objectives or water quality standards are not being achieved; restriction or exclusion of livestock to protect special status plant and animal species (e.g., sage grouse); restriction or exclusion of livestock to control noxious weeds; and actions to protect cultural resources. Other actions or influences such as wildland fires and prescribed fire followed by rehabilitation may reduce animal unit months and management flexibility of a given allotment in the short term. Changes in permitted use and season of use within an individual allotment would depend on the array of resources affected by livestock use, management objectives, intensity of livestock management actions implemented by livestock operators, and opportunities to develop and implement livestock grazing use while sustaining resource



values. Changes in grazing management practices, stocking levels, seasons of use, timing and duration would be implemented to progress toward achievement of the standards, to improve health, vigor, and productivity of desirable perennial vegetation and to maintain or improve rangeland health and watershed function. Additional management actions to include rangeland projects such as spring development, wells, and fences would be constructed to maintain or make progress toward the desired range of conditions and proper functioning condition.

Temporary nonrenewable use could be authorized on an annual basis when forage is temporarily available above active use. Temporary nonrenewable use would be authorized on a case-by-case basis provided it is consistent with protection of watershed health, multiple use objectives, and multiple uses of the allotment. Temporary nonrenewable use provides a degree of flexibility in accommodating unusual situation (e.g., fires) that may arise on individual allotments during a good forage year.

The BLM would continue to authorize water hauling to improve livestock distribution, as may be necessary for efficient and uniform utilization within an allotment. To the extent that such practices contribute to trampling and concentrated grazing in the vicinity of water troughs, such impacts would continue.

#### **Impacts from Other Programs.**

*Vegetation.* Vegetation restoration or watershed treatment activities are expected to continue at the same levels as the present under Alternative A (i.e., approximately 10,000 acres per year based on a historical average). Since seedling establishment and soil stabilization period of at least 2 to 3 years is typically projected for seeding projects, such projects could result in an approximate 30,000-acre (minimum) temporary reduction in available forage at any given point in time until these areas can be safely grazed. Additional forage developed as a result of vegetation treatments would continue to be allocated to a combination of livestock, wildlife, and wild horses based on existing management direction (see **Table 2.4-1**).

*Fish and Wildlife.* Wildlife resources would continue to compete in varying degrees with livestock uses for forage, water, and habitat. Big game species (e.g., pronghorn, mule deer, and elk) rely on some of the same forage resources used by sheep and cattle. Localized competition for forage and water resources between big game species and livestock would continue, particularly as elk populations grow and ecological system conditions continue to deteriorate in various portions of the District.

*Special Status Species.* If historic trends of ecological system deterioration within the Great Basin continue as expected under Alternative A, listing of additional sagebrush-obligate plant and wildlife species as threatened or endangered is highly probable, possibly within the next few decades. Such listing would adversely affect all other land uses, including livestock grazing, by imposing severe regulatory restrictions and possibly grazing closures on these areas in the long term.

*Wild Horses.* Current competition between wild horses and livestock for forage likely would intensify with any additional deterioration of rangeland health and forage availability. This competition would be



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alleviated in those herd management areas where wild horse populations are reduced to and maintained at appropriate management levels.

*Lands and Realty.* To the extent that grazing allotments overlap with lands identified as available for possible disposal (28,531 acres identified for potential disposal under alternative; see Section 2.5.12 for details), these allotments may be affected (modified or eliminated) if, and when, sales occur, resulting in a reduction of animal unit months on the affected allotment.

*Renewable Energy.* Although some surface disturbances and vegetation removal may result from renewable energy development (primarily wind energy), such disturbances would generally be limited in magnitude and extent, with revegetation of most disturbed areas occurring after construction. Thus, the impacts to livestock grazing from such development are expected to be negligible.

*Travel Management and Off-highway Vehicle Use.* Under Alternative A, the construction of new roads and trails would be relatively limited. Thus, new or additional conflicts between livestock grazing and road construction are expected to be minor. However, since the majority of the District (about 9.8 million acres) would remain open to off-highway vehicle use and the demand is expected to grow substantially, conflicts with such traffic on existing trails are expected to occur at an ever increasing frequency. Off-highway vehicle traffic, when using roads and trails, impacts vegetation growth, extent of vegetation cover, and erosion patterns, resulting in secondary impacts on livestock behavior and use patterns.

*Recreation.* Increasing recreational demand, especially for off road vehicle use, would create new conflicts with livestock grazing. This is especially true in the southern portion of the District, where population demographics suggest the greatest future recreational demand. Under Alternative A, one special recreation management area of approximately 750,000 acres would remain in the District.

*Mineral Extraction.* Construction activities associated with mineral exploration would continue to disrupt livestock grazing through the direct removal of forage. However, based on the implementation of the terms and conditions for mineral leasing and the assumption that mineral development activities would be temporary and of very limited scope (approximately 15,000 acres of short-term disturbance) relative to the overall area of the District, conflicts with livestock grazing would be expected to be minor.

*Watershed Management.* Any additional forage produced within the Schell Resource Area as a result of fire rehabilitation or other vegetation manipulation would be allocated at a ratio of 70 percent to livestock and wild horses and 30 percent reserved for wildlife. In the remainder of the District, additional or surplus forage would be allocated proportionately among all qualified users. The level of additional forage resulting from vegetation treatments under Alternative A is not expected to be of a magnitude that would result in noticeable changes in livestock numbers following such allocations.

*Fire Management.* The rates of fire use (managed natural wildfires) allowable under the existing fire plan would result in increased use of fire in future years and greater areas of vegetation treatment and restoration activities than what has occurred over the past few decades. Thus, greater total areas may be temporarily removed from grazing during the periods of vegetation restoration or recovery on individual



treated sites. Forage production on these areas would be enhanced following vegetation restoration or recovery.

*Noxious and Invasive Weed Management.* The spread of noxious and invasive weeds into grazing allotments could result in the temporary closure of affected grazing lands in order to expedite treatment and eradication measures. Noxious and invasive weeds may crowd out more desirable and palatable native species and introduce toxic substances into forage mixtures. This may result in stocking reductions in the affected allotment for indefinite periods of time.

*Special Designations.* Under Alternative A, no additional ACECs or other special designations that would result in closures to livestock grazing are proposed. As a result, there would be no additional impact to livestock grazing as a result of special designations management activities.

**Conclusion.** Approximately 11.2 million acres would remain open to grazing under existing management on 235 allotments, subject to potential land sales currently authorized for possible disposal.

### **Alternative B**

**Impacts from Livestock Grazing Management Direction.** Under Alternative B, livestock grazing would continue on approximately 7.6 million acres within the Ely District (prior to potential land disposals). The authorization of additional possible land disposal under this alternative may result in the modification or elimination of individual allotments. In addition to those areas previously closed under the Desert Tortoise Amendment, this alternative would close to grazing the remaining desert tortoise habitat within the Mojave Desert (approximately 542,100 acres) approximately 3,038,100 acres of bighorn sheep habitat, and 25,700 acres within new ACECs. These closures would affect a total of 189 of the 235 existing allotments (see **Map 2.4-40**).

Actions which may contribute to stocking level reductions or changes to grazing management practices or revisions to grazing schedules and seasons of use may include: assessment of rangeland health standards in which a determination has been made that standards are not being achieved and livestock grazing is a causal factor; restriction or exclusion of livestock to meet objectives within pastures where riparian objectives or water quality standards are not being achieved; restriction, prescription, or exclusion of livestock to protect special status plant and animal species (e.g., sage grouse); restriction or exclusion of livestock to control noxious weeds; and actions to protect cultural resources. Other actions or influences such as wildland fires and prescribed fire followed by rehabilitation may reduce animal unit months and management flexibility in the short term. Changes in permitted use and season of use within an individual allotment would depend on the array of resources affected by livestock use, management objectives, intensity of livestock management actions implemented by livestock operators, and opportunities to develop and implement livestock grazing use while sustaining resource values. Changes in grazing management practices, stocking levels, seasons of use, timing and duration would be implemented to progress toward achievement of the standards, to improve health, vigor, and productivity of desirable perennial vegetation and to maintain or improve rangeland health and watershed function. Additional management actions to include rangeland projects such as spring development, wells, and fences would be constructed to maintain



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or make progress toward the desired range of conditions and proper functioning condition. Reductions in allowable stocking level on allotments may result in both short- and long-term impacts depending on the reason for the change. For example, temporary reductions would be required on some allotments as various watersheds are treated. In other cases, long-term reductions could be required to meet standards or to protect special status species.

Changes in kind of livestock would be allowed on a temporary or permanent basis, where necessary and as appropriate, including potential rotation grazing between different types of livestock, to achieve standards for rangeland health or other multiple use objectives. Livestock grazing would be eliminated in occupied and historic ranges and migration routes for desert and Rocky Mountain bighorn sheep (approximately 3,038,100 acres). This approach would affect operations on 189 allotments.

The non-use relinquished permits could be used for such purposes as establishing forage reserves or providing improved watershed protection. In comparison to Alternative A, this approach would provide: 1) greater flexibility for allocation of increased forage resulting from watershed treatments; 2) a shift toward managing on a watershed rather than an allotment basis; and 3) greater flexibility of management toward achievement of the Resource Advisory Council standards and guidelines (Appendix A).

Authorized use would not exceed the level of use in the term permit, and temporary nonrenewable use would not be authorized. Additional forage available on treated areas would not be allocated to livestock or reserved for wildlife. Alternately, the additional forage production would contribute toward meeting watershed goals and rangeland health standards.

Water hauling would be authorized, as necessary, to achieve rangeland health standards. Impacts associated with this action are expected to be similar to water hauling under Alternative A.

**Impacts from Other Programs.** Livestock grazing impacts associated with mineral extraction and noxious and invasive weed management activities would generally be similar to those described for Alternative A.

*Vegetation.* The area identified for potential vegetation treatments under Alternative B is more than twice that of Alternative A. It is expected that the area treated each year also would be substantially greater under Alternative B than Alternative A. It is estimated that a total area in excess of 100,000 acres could be affected at a given time under Alternative B, portions or all of which could require temporary reductions in livestock grazing on affected allotments. It is unlikely, however, that all of the treated areas would involve seeding or other activities that would interfere with continuing a livestock grazing program. Selection of areas and methods for treatment would occur at the watershed analysis stage, with efforts being made to prevent excessive areas being treated concurrently within the same grazing allotment or watershed. Additional forage produced on treated areas also would be used as forage reserves to offset these temporary reductions.

*Fish and Wildlife.* Competition between domestic livestock and wildlife for forage and water resources would continue, but may be expected to increase near the vegetation treatment areas where both uses temporarily would be displaced. Competition in these same areas likely would be alleviated following



successful vegetation treatments as forage and habitat conditions are improved relative to current conditions. Competition also would increase in those untreated areas where forage and habitat conditions continue to deteriorate. Protection of fishery habitat may necessitate the creation of additional water sources (e.g., water hauls) to minimize impacts to livestock grazing.

The management emphasis on desert and Rocky Mountain bighorn sheep in all occupied and historic ranges as well as migration routes would result in the partial or full closure of 189 allotments.

*Special Status Species.* The vegetation treatment program and other changes in management actions under Alternative B would help, in the short and long term, to slow or stop the gradual deterioration of ecological systems within the District while restoring landscapes already in poor ecological health. This process would reduce the potential for future listing of additional sagebrush-obligate species in the Great Basin portion of the District under the Endangered Species Act, thereby potentially avoiding additional restrictions on other users, including livestock. Various protective measures to be implemented under this alternative, especially around riparian areas and streams, may require alteration of livestock grazing practices (e.g., fencing or alternative water sources) or seasons of use in these areas. These impacts to livestock grazing could be either short or long term depending on the situation involved.

*Wild Horses.* Under Alternative B, several of the existing herd management areas would be eliminated and wild horse management would focus on those areas where conditions exist to sustain genetically viable populations in a thriving natural ecological balance. This change in management would eliminate wild horse competition and conflicts with livestock in numerous allotments throughout the southeastern portion of the District. Management to reduce and maintain wild horse populations on the remaining herd management areas to the appropriate management levels would limit the degree of competition with livestock in those areas.

*Lands and Realty.* Under Alternative B, approximately an additional 87,834 acres would be available for possible disposal (see Section 2.5.12 for details). Adjustment or elimination of affected livestock grazing allotments would occur if and when these lands are sold. Impacts from land disposal would be long term or permanent.

*Renewable Energy.* Under Alternative B, approximately 201,000 acres would be designated as wind energy development areas and 6.8 million acres would be designated as solar energy development areas. While only a fraction of this area may ever be developed for these renewable energy facilities, this alternative would encourage development that may, to a limited degree, conflict with current livestock grazing. These conflicts may include removal of specific facility areas from grazing, construction of access roads and utility corridors, and increased vehicle traffic in remote areas. These conflicts are not expected to cause more than minor impacts to livestock grazing operations.

*Travel Management and Off-highway Vehicle Use.* Under Alternative B, the portion of the District open to cross-country off-highway vehicle use would be eliminated and the remainder would be either closed or limited to use only on designated roads and trails. The District transportation plan would be updated as part of the watershed analysis and unnecessary roads would be closed and rehabilitated. Under this alternative,



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the elimination of areas open to cross-country off-highway vehicle use would result in substantially fewer conflicts with livestock grazing than in Alternative A.

*Recreation.* Escalating recreational demand would continue to create new conflicts with livestock grazing, particularly in the southern portion of the District where the greatest future recreational demand is expected to occur. Under Alternative B, nine special recreation management areas totaling approximately 2.68 million acres would be established in the District. While management of these areas may not preclude grazing, the conflicts between grazing use and recreation are expected to increase on and around these areas.

*Watershed Management.* Any additional forage produced beyond meeting rangeland health standards as a result of fire rehabilitation or other vegetation manipulation would be reserved for watershed maintenance and wildlife, not allocated to livestock.

*Fire Management.* Under Alternative B, the use of fire as a tool in vegetation management and restoration would be more widespread than under Alternative A. Overall, however, the interactions with livestock grazing are expected to be similar in nature to those described for Alternative A, but would occur on a larger scale based on the increased vegetation treatments. Restoration of vegetation resilience and return to historical fire regimes would reduce impacts to livestock grazing when fires occur.

*Special Designations.* Eighteen new ACECs would be designated under this alternative, four of which would be closed to grazing on a combined area of 25,700 acres.

**Conclusion.** Approximately 3.6 million acres of additional grazing area affecting 189 total allotments would be closed to grazing for desert tortoise habitat, bighorn sheep habitat, and new ACECs (beyond the 212,500 acres already closed in the existing desert tortoise ACECs) resulting in long-term impacts to livestock grazing. Vegetation treatments and protection of freshly seeded areas also could temporarily affect grazing on substantial areas during the treatment process causing short-term impacts. It is expected, however, that increased forage production on previously treated areas would offset temporary reductions in these allotments.

### Alternative C

**Impacts from Livestock Grazing Management Direction.** Areas available for grazing under Alternative C would be the same as Alternative A except that 9,600 additional acres would be closed in three new ACECs. The authorization of additional possible land disposals under this alternative totaling 288,744 acres (see Section 2.5.12 for details) may result in modification or elimination of allotments if and when these lands are sold.

Under Alternative C, the 7,843-acre Haypress allotment would be managed as a horse preserve in partnership with the National Mustang Association or some other entity. This allotment is currently permitted for 154 animal unit months of use by horses and this action would have negligible effect on livestock grazing.



Actions which may contribute to stocking level reductions or changes to grazing management practices or revisions to grazing schedules and seasons of use may include: assessment of rangeland health standards in which a determination has been made that standards are not being achieved and livestock is a causal factor; restriction or exclusion of livestock to meet objectives within pastures where riparian objectives or water quality standards are not being achieved; restriction or exclusion of livestock to protect special status plant and animal species (e.g., sage grouse); restriction or exclusion of livestock to control noxious weeds; and actions to protect cultural resources. Other actions or influences such as wildland fires and prescribed fire followed by rehabilitation may reduce animal unit months and management flexibility in the short term. Changes in permitted use and season of use within an individual allotment would depend on the array of resources affected by livestock use, management objectives, intensity of livestock management actions implemented by livestock operators, and opportunities to develop and implement livestock grazing use while sustaining resource values. Changes in grazing management practices, stocking levels, seasons of use, timing, and duration would be implemented to progress toward management objectives including achievement of the standards; improvement in health, vigor, and productivity of desirable perennial vegetation; and maintenance of or improvement in rangeland health and watershed function. Additional management actions to include rangeland projects such as spring development, wells, and fences would be constructed to maintain or make progress toward the desired range of conditions and proper functioning condition. Reductions in allowable stocking rates on allotments may result in both short- and long-term impacts depending on the reason for the change.

Under Alternative C, livestock grazing could be authorized where appropriate on the basis of performance based grazing with no specific numbers and dates in the permit. Permit terms and conditions would identify total active use and possibly when and how specific livestock numbers and dates would be changed. Flexibility in management of livestock would be identified in the terms and conditions of term permits and annual grazing authorizations. The use of monitoring results would not be included in annual authorizations but would be used to help develop management adaptations for future grazing seasons. This approach would require extra effort on the part of the permittee to conduct the necessary monitoring and implement the required changes in grazing practices. It also would require additional administrative effort by the BLM to organize and manage this approach.

This alternative would authorize change in kind of livestock with the same approach as Alternative B, but livestock grazing would not be eliminated from bighorn sheep ranges. Management in these areas would be the same as Alternative A. This approach would have little or no change in impacts to rangeland resources or the grazing permittees.

Alternative C would provide the flexibility for BLM to use relinquished permits for the creation of forage reserves available for research or temporary use by permittees who are displaced for any reason. The Tamberlaine Allotment, if relinquished, would be managed as a forage reserve. This alternative would generate positive benefits for other permittees within the District.



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Livestock grazing effects associated with the use of temporary nonrenewable grazing would be the same as described for Alternative A. Effects associated with the authorization for water hauling also would be the same as described for Alternative A.

**Impacts from Other Programs.** Livestock grazing impacts associated with mineral extraction and noxious and invasive weed management activities would be the same as described for Alternative A. Livestock grazing impacts associated with special status species, wild horses, and renewable energy would be the same as, or similar to, Alternative B. The following interrelated programs would result in different impacts compared to Alternatives A and B.

*Vegetation.* Effects of vegetation treatments on livestock grazing would be essentially the same as Alternative B for industrial areas during the period of treatment and restoration. After the first few years of treatments, however, the additional forage produced in these areas would be allocated to livestock and could, at least partially, offset the reduction in available acreage. Thus, impacts from vegetation treatment would typically be short term on a given allotment.

As a result of vegetation treatments particularly in sagebrush, mountain shrub and mountain mahogany plant communities, short-term reductions in authorized livestock use, restriction or exclusion of livestock, changes in period of use, or other management actions may occur in order to implement restoration actions. Authorized use may increase following the restoration activity based on additional forage produced and achievement of rangeland health objectives. Restoration and maintenance of vegetation communities to achieve desired range of conditions and varying vegetation states or mosaics of the plant communities across the landscape would increase herbaceous production. Effects of vegetation treatments on livestock grazing also may be essentially the same as Alternative B following treatment. Management actions may be required prior to treatment in order to allow and promote treatment effects and restoration. These may include; changes in permitted use within the project area, restriction or exclusion of livestock or other management actions.

Treatment of pinyon-juniper woodlands and quaking aspen stands also may require adjustments to stocking levels, periods of use or other actions in order to implement actions necessary to maintain or improve pinyon-juniper woodlands and quaking aspen stands. Such impacts would typically be of short duration.

In those vegetation types (e.g., Mojave Desert, salt desert shrub, and riparian/wetland) where the vegetation treatments primarily would be passive in nature (i.e., biological treatments), livestock grazing would be adjusted if current management does not allow for the maintenance or measurable progress toward achieving the desired range of conditions. These impacts could be either short or long term depending on the situation involved.

*Fish and Wildlife.* Interaction and competition between big game and livestock under this alternative would be similar to Alternative B. Under this alternative, restoration emphasis for enhanced herbaceous forage production would favor management for elk as well as livestock.



*Lands and Realty.* Under Alternative C, approximately 288,744 additional acres would be available for possible disposal. Adjustment or elimination of affected livestock grazing allotments would occur if and when these lands are sold. Such impacts would be long term or permanent in nature.

*Travel Management and Off-highway Vehicle Use.* Under Alternative C, approximately 734,000 acres would be identified for off-highway vehicle emphasis areas and 32,000 acres of dry lake beds would be open to cross-country off-highway vehicle use. The remainder either would be closed or limited to use only on designated roads and trails. The reduced area available for off-highway vehicle use under this alternative likely would result in fewer conflicts with livestock grazing than under Alternative A but more than under Alternative B.

*Recreation.* Escalating recreational demand would continue to create new conflicts with livestock grazing, particularly in the southern portion of the District, where the greatest future recreational demand is expected to occur. Under Alternative C, nine special recreation management areas totaling approximately 3.3 million acres would be established in the District. While management of these areas may not preclude grazing, the conflicts between grazing use and recreation are expected to increase on and around these areas.

*Watershed Management.* Any additional forage produced beyond meeting rangeland health standards as a result of fire rehabilitation or other vegetation manipulation would be allocated to livestock. The level of additional forage resulting from vegetation treatments under the Alternative C is expected to be of a magnitude that largely would offset potential reductions in livestock numbers during the treatment process.

*Fire Management.* Under Alternative C, full suppression of wildland fires would occur and, therefore, the initial affected area of interaction with livestock grazing would be less than or similar to Alternative A. However, with continued fire management under this approach, it is expected that accumulation of heavy fuels in untreated areas would eventually lead to situations where suppression would become impractical, if not impossible, resulting in large-scale, intense fire events. Thus, on a long-term basis, fire impacts to livestock grazing would be greater than either Alternative A or B.

*Special Designations.* Twenty new ACECs would be created, four of which would involve closure to grazing thus removing grazing on approximately 9,600 additional acres.

**Conclusion.** Approximately 11.2 million acres would remain available for grazing in 235 existing allotments, subject to potential land sales of up to 288,744 acres. These areas would be closed to grazing when they are sold. Long-term fire impacts to grazing would be substantial. Vegetation treatments and protection of freshly seeded areas also could temporarily affect grazing on substantial areas during the treatment process, but it is expected that increased forage production on previously treated areas would offset temporary reductions in these allotments.



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### Alternative D

Under Alternative D, no livestock grazing would be permitted in the District. Therefore, livestock grazing per se would cease to impact or be impacted by other resource uses and users. The termination of livestock grazing, however, would generate substantial impacts to current allotment permittees and to revenues received by the BLM for grazing fees (addressed under Economic and Social Conditions). It also would affect numerous other resource programs. These effects are addressed in those various resource discussions.

Since this decision would not be consistent with current regulations and agency policy, selection of this alternative would require Congressional approval for implementation.

**Conclusion.** Elimination of the livestock grazing program within the District would constitute a major change in policy with attendant impacts to livestock grazing, other resource uses, and users.

### Alternative E

**Impacts from Livestock Grazing Management Direction.** The total lands available for grazing in Alternative E would be similar to Alternative A until modified by various other constraints associated with land disposals. Approximately 3,300 acres would be closed to grazing in one new ACEC. This alternative would authorize potential additional land disposals of approximately 95,677 acres.

No domestic sheep or goat grazing would be allowed within 9 miles of desert bighorn sheep habitat in the absence of effective separating barriers. As indicated on **Map 2.4-41**, this would potentially affect 38 allotments currently permitted for grazing these kinds of livestock. Management of the Haypress allotment would be the same as under Alternative C and would have negligible effect on operation of other allotments.

Actions which may contribute to stocking level reductions or changes to grazing management practices or revisions to grazing schedules and seasons of use would be the same as discussed earlier for Alternative B.

#### *RMP Management Focus*

*The restoration and maintenance of healthy ecological systems within watersheds is a primary focus for the future management of the Ely District. Healthy ecological systems are geographically diverse and change over time. They are compatible with soil potential and are resilient to disturbance.*

*Resources and resource uses will be managed to restore or maintain ecological health. Certain resource management changes and active treatments may need to be implemented, in portions of watersheds, to accomplish this objective. Adaptive management will be pursued to avoid deteriorating conditions favoring invasive plants and catastrophic fires. Any projects will be implemented so as to result in a mosaic of vegetation within a watershed.*

*In the long term, natural disturbance (such as drought or fire) will occur and fewer treatments will be needed to maintain ecological health. The result will be a variety of vegetation phases within a watershed, which will provide diverse, healthy conditions for future generations.*



Under Alternative E, permit administration would be similar to Alternative A except that performance-based grazing would be authorized on a case-by-case basis. Authorized use could fluctuate below and above active use on the term permit based on forage production. Temporary nonrenewable use could be authorized on an annual basis when forage is temporarily available above active use. During dry years, BLM would approve permittee applications or would require permittees to use less forage than the active use authorized by the term permit. Stocking levels would be reduced based on a lower amount or lack of forage production, poor forage condition and reduced water availability. During wet years, BLM could approve temporary non-renewable use.

Authorization for conversions in kind of livestock would be the same as Alternative B, but domestic sheep and goat grazing would not be allowed within 9 miles of desert bighorn sheep habitat except where effective separation barriers are present. As mentioned above, this constraint on these kinds of livestock would affect 38 allotments currently permitted for sheep or goat use.

The effects associated with temporary nonrenewable use would be the same as described for Alternative A. The effects of water hauling would be the same as Alternative B, and effects associated with the handling of non-use relinquished permits would be the same as Alternative C.

**Impacts from Other Programs.** Livestock grazing impacts associated with mineral extraction and noxious and invasive weed management activities would be the same as, or similar to, those described for Alternative A. Impacts associated with special status species, wild horses, lands and realty, renewable energy, travel management and off-highway vehicle use and fire management activities would be the same as described for Alternative B. The following interrelated programs would result in different impacts compared to Alternatives A, B, and C.

*Vegetation.* Livestock grazing impacts associated with vegetation treatments would be similar to Alternative B. Increased forage on restored areas largely could offset reductions in areas undergoing treatment.

*Fish and Wildlife.* Interaction and competition between domestic livestock and wildlife, other than bighorn sheep, for forage and water resources would be similar to Alternative B. Competition around treated areas would likely be alleviated following successful vegetation treatments, as forage and habitat conditions are improved relative to current conditions.

*Special Status Species.* Under this alternative, desert bighorn sheep management would affect domestic sheep and goat operations, but not cattle operations. Sheep and goat grazing would be eliminated within desert bighorn habitat plus a 9-mile buffer. This closure would affect all or portions of 49 sheep and goat grazing allotments and cover approximately 2.96 million acres in the absence of effective barriers to separate desert bighorns from domestic animals.



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*Recreation.* Effects of recreation management would be similar to Alternative B except that the area identified for off-highway vehicle use emphasis would be 734,000 acres, the same as Alternative C. This would allow more widespread conflicts between such use and livestock grazing than under Alternative B.

*Watershed Management.* Any additional forage produced beyond meeting rangeland health standards as a result of fire rehabilitation or other vegetation manipulation would be allocated to livestock and wild horses and reserved for wildlife on a balanced basis. The level of additional forage resulting from vegetation treatments under Alternative E is expected to be of a magnitude that would largely offset potential reductions in livestock numbers during the treatment process.

*Special Designations.* Closure of livestock grazing would occur on approximately 3,300 additional acres in one new ACEC.

**Conclusion.** Approximately 11.2 million acres would remain available for grazing in 235 existing allotments, subject to potential land sales of up to 114,200 acres. These areas would be closed to grazing when they are sold. Sheep and goat grazing would be affected on approximately 2.96 million acres in 49 existing allotments. Vegetation treatments and protection of freshly seeded areas also could temporarily affect grazing on substantial areas during the treatment process, but it is expected that increased forage production on previously treated areas would offset temporary reductions in those allotments.



## **4.17 Woodland and Native Plant Products**

### **Impact Issues**

Woodland and native plant products would be affected by activities that modify the quantity and quality of vegetation resources either directly or indirectly.

### **Assumptions for Analysis**

- Woodland and native plant products may originate from either woodland or non-woodland plant communities. In fact, several of the traditional woodland products such as pinyon nuts, Christmas trees, and posts may be harvested from tree species growing in a non-woodland site.

### **General Impacts from Vegetation Treatment Tools and Techniques**

Please refer to Section 4.5, Vegetation, for general impacts from vegetation tools and techniques. Tools and techniques that may positively or negatively affect availability of woodland and native plant products include fire, mechanical and chemical treatments, and grazing management.

### **Interactions with Other Programs**

The woodland and native plant product management program within the Ely District potentially would be affected by actions within the resource management programs for vegetation, cultural resources, lands and realty, renewable energy, travel management and off-highway vehicle use, geology and mineral extraction, watershed management, fire management, noxious and invasive weed management, and special designations.

**Goal – Provide opportunities for traditional and non-traditional uses of vegetation products on a sustainable, multiple-use basis.**

### **Alternative A**

**Impacts from Woodland and Native Plant Products Management Direction.** The resource-specific management program would continue to focus on woodland products for fuelwood, posts and poles, Christmas trees, and pinyon pine nut harvest. Woodland and other native plant products for public and commercial use are generally restricted to short distances from roads. The greatest demands are for tree species, especially pinyon pine and juniper. Due to the documented increases in woodland density and extent, availability would remain high compared to demand.

Approximately 5.0 million acres would be available for woodland product use in the District, of which approximately 3.6 million acres is pinyon-juniper woodland and 1.2 million acres is pinyon-juniper vegetation that has invaded into low elevation sagebrush communities. Rowland et al. (2003) estimated that approximately 35 percent of the sagebrush communities in the Ely District are at moderate or high risk for



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replacement by pinyon-juniper woodlands. Based on these estimates as discussed in detail in Section 3.17.1, the following woodland products would be available within the District:

- 15 to 30 million cords of fuelwood (average production – 3 to 6 cords per acre);
- 23 million Christmas trees (based on 15 trees per acre and singleleaf pinyon occurring within 30 percent of the pinyon-juniper woodlands);
- 75 to 150 million posts and poles (average production – 15 to 30 posts and poles per acre); and
- 225 to 450 million pounds of pinyon nuts (average production during favorable years – 150 to 300 pounds per acre).

Fuelwood cutting would be permitted anywhere within the District except in closed areas. This would continue to provide opportunities for personal and commercial use of the pinyon-juniper resource. Over the past 7 years, the Ely Field Office has issued fuelwood permits for an average of 1,875 cords per year with a high of 2,390 cords in 1998 to a low of 1,515 cords in 2000. Based on the cords estimated District-wide, the rate at which woodlands are reportedly increasing, and low public demand, this level of green tree fuelwood harvest appears to be more than sustainable.

Permit sales for other woodland product over the past 7 years included Christmas trees ranging from 540 trees in 2004 to 4918 trees in 1999; pinyon nuts ranging from 0 pounds in 2000 and 2003 to 26,000 pounds in 2002; and posts ranging from 1500 posts in 2002 to 3118 posts in 1998.

Seed collection would be available for commercial purposes on a case-by-case basis; however, cactus and succulent collection would continue to be for personal use only. The collection of these plants only during salvage opportunities is a conservative practice that contributes to the perpetuation of affected plant populations. Commercial collection of seed is unlikely to occur at a substantial level under this alternative, because activities are limited to hand and limited mechanical collection only.

### **Impacts from Other Programs.**

*Vegetation.* Pinyon and juniper management in sagebrush communities tends to involve removal of young, small trees with a low volume of wood products. Where these trees are mature with closed canopy in sagebrush communities, thresholds have been crossed that would make restoration costly and difficult.

The District has averaged about 10,000 acres per year of fire rehabilitation and other vegetation treatments including aerial seeding. Continued removal of pinyon and juniper trees at the current rate is unlikely to affect their relative availability for public and commercial use. Tree removal activities implemented in close proximity to roads and communities may provide increased slash for public use. Slash removal methods involving burning, chipping, or hauling could reduce woodland product availability depending on location. Where vegetation treatments are remote, forest product availability would be even less affected.

Management activities would include the treatment of approximately 1.1 million acres of pinyon-juniper woodland and maintenance of approximately 2.5 million acres that are currently in desired states. Impacts to pinyon-juniper woodlands from the vegetation treatments would be relatively limited in the short term (next



decade) and would gradually increase as more areas are treated over the next 10 to 100 years. Treatment and maintenance activities within pinyon-juniper woodland would likely increase the availability of woodland products, especially if areas are located within close proximity of existing roads. The availability of woodland products from treated and maintained pinyon-juniper woodlands would continue to exceed the demand for woodland products in the long term.

*Cultural Resources.* Commercial woodland harvest activities are restricted in space or time to conserve natural and cultural resources. All standard operating procedures would continue to be implemented without impact to the overall availability of wood products or accomplishment of this management goal.

*Lands and Realty.* Lands currently designated for possible disposal are described in Section 4.12. Rights-of-way often go through woodlands in remote areas, but access to rights-of-way also can open up woodland access for public use. Approximately 28,531 acres would be available for possible disposal, but only a small portion of this is occupied by woodlands.

*Renewable Energy.* The impacts of providing opportunities for renewable energies would be the same or similar to those described for lands and realty program, namely creation of additional utility corridors and access roads.

*Travel Management and Off-highway Vehicle Use.* The woodland and other vegetation products program is largely tied to and dependent upon the transportation system on the District. Approximately 9.8 million acres are open to off-highway vehicle use under current management. Current transportation planning accommodates public demand for products, as it is currently perceived. No permanent road closures are planned under Alternative A; although temporary closures could occur for construction, repair, or special events. User conflicts between woodland product activities, including pinyon pine nut collecting, and off-highway vehicle use or other recreation have not been identified, presumably due to the low level of public activity on the District. Woodland and native plant products would still be available through off-road travel access.

*Mineral Extraction.* Under Alternative A, approximately 1.1 million acres would be closed to mineral extraction leaving the majority of the Ely District open. Under the reasonably foreseeable development scenario based on the best available information, it is estimated that about 15,600 acres of the Ely District would be affected. Therefore, anticipated impacts to vegetation resulting from mineral development would be limited to less than 16,000 non-contiguous acres.

Most disturbed areas would be reclaimed over several decades. Approximately 7,500 acres of pinyon-juniper woodland could be lost, most likely within the high potential development areas.

*Watershed Management.* Under Alternative A, the watershed priority schedule would not affect the availability of woodland and native plant products.

*Fire Management.* Current trends in fire frequency and severity include increased frequency of stand-replacing fires in the pinyon-juniper woodland ecological system. These trends are associated with



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climatic change, drought cycles, and fuel accumulations. Under Alternative A, wildland fires incrementally could reduce the availability of some pinyon-juniper woodland for public and commercial use depending on location. The mean annual number of acres burned by wildfire in the woodland and other vegetation types is displayed in **Figure 3.20-2**.

*Special Designations.* The three current ACECs designated on the Ely District have no fuelwood resources and, therefore, would have no effect upon woodland product availability. Plant collecting is limited within these three areas and would preclude harvest of most, if not all, personal and commercial plant products within a total of 212,500 acres.

**Conclusion.** Current supplies of woodland and native plant products including fuelwood, posts and poles, Christmas trees, pinyon pine nuts, various native seeds, and live plants of selected species for transplantation are adequate to meet existing demands. It is expected that availability of these woodland products would continue to exceed the expected demand.

### Alternative B

**Impacts from Woodland and Native Plant Products Management Direction.** The woodland products program for this alternative would be similar to that described under Alternative A except additional species would be made available for fuelwood, Christmas trees, and posts. Greater availability of species provides increased choices for public use of forest and woodland species and products.

In addition, Alternative B would permit mechanical methods for commercial seed harvesting, which would substantially increase the availability of seed for collection over the current policy. Mechanical harvest of seed would be permitted for personal and commercial purposes, potentially making seed resources widely available. This is unlikely to occur on a large-scale based on the high levels of livestock grazing that occur district-wide precluding seed production on herbaceous grasses and forbs in large areas. For herbaceous plants, there also is unlikely to be large-scale opportunity because of the low density of plants to harvest from in most areas, except perhaps those dominated by crested wheatgrass. Where shrubs such as mountain mahogany are dense, commercial harvest opportunities could be substantial.

Approximately 4.6 million acres would be available for woodland product use in the District, including approximately 3.2 million acres of pinyon-juniper woodland and approximately 1.2 million acres of pinyon-juniper vegetation that has invaded into low elevation sagebrush communities (see **Map 4.5-1**). The majority of treatment within pinyon-juniper woodland would occur in the overmature sites where canopy cover would be reduced from an average of approximately 40 percent to an average of approximately 20 to 40 percent. In addition, approximately 4,200 acres of aspen communities (Forestland Ecological Site Description – 28BY055) would be available for fuelwood collection. Fuelwood collection within aspen communities would continue to occur and would be used as a tool for overall management and regeneration of aspen stands in the District. Based on these estimates, the following woodland products would be available within the District:

- 14 to 28 million cords of fuelwood (average production – 3 to 6 cords per acre);



- 21 million Christmas trees (average production – 15 singleleaf pinyon trees per acre; singleleaf pinyon occur within 30 percent of the pinyon-juniper woodlands);
- 69 to 138 million posts and poles (average production – 15 to 30 posts and poles per acre);
- 210 to 400 million pounds of pinyon nuts (average production during favorable years – 150 to 300 pounds per acre); and
- 21,000 to 84,000 cords of aspen fuelwood (average production – 5 to 20 cords per acre).

**Impacts from Other Programs.** Impacts to woodland and native plant products associated with the cultural resources and mineral extraction activities would be the same as described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Vegetation.* Under Alternative B, woodlands would be treated and managed to achieve the range of healthy conditions identified in **Table 2.4-1**. This management direction would allow for extensive reductions in tree densities, which would have potential for personal and commercial uses.

The removal of pinyon and juniper trees to meet landscape objectives potentially could affect their relative availability for public and commercial use in some areas. How much and what type would depend on many factors such as method of treatment and methods of slash disposal. Tree removal activities implemented in close proximity to roads and communities may provide increased slash for public use. Slash removal methods involving burning, chipping, or hauling could reduce woodland product availability depending on location. Where vegetation treatments are remote, forest product availability would be less affected. Management activities would include the treatment of approximately 2.7 million acres of pinyon-juniper woodland and maintenance of approximately 860,000 acres that are currently in desired states. General impacts to pinyon-juniper woodlands from the vegetation treatments and maintenance activities would be the same as described for Alternative A. On a long-term basis, the production of woodland products from restored and resilient communities is expected to exceed current levels.

*Lands and Realty.* Impacts would be the same as Alternative A except approximately 88,000 acres would be designated for possible disposal, but less than 20 percent of this total is occupied by woodlands. These areas would remain available for public uses unless and until a site-specific land transaction is approved.

*Renewable Energy.* Areas that are set aside for development of renewable energy may affect the availability of woodland and other vegetation products. Renewable energy development may provide access to new areas of product availability depending on site specific characteristics, type of technology, and the nature of the proposed development.

*Travel and Off-highway Vehicle Use.* Under Alternative B, cross-country off-highway vehicle use would not be allowed. In addition, 310,000 acres of the Ely District would be designated as off-highway vehicle emphasis areas. The combination of these designations would reduce the availability of woodland and native plant products that would have been obtained through off-road travel under Alternative A.



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*Watershed Management.* The majority of watersheds on the District have substantial pinyon-juniper woodland components. As watershed analyses are conducted and vegetation treatments are implemented, access to and productivity of woodland products would be reduced on a local basis.

*Fire Management.* The use of fire to the greatest extent following watershed analysis would likely reduce the amount of pinyon-juniper woodland and woodland products provided from these areas over the long term. However, the availability of woodland products from other pinyon-juniper woodlands within the District would continue to exceed the demand for woodland products in the long term. The amount and diversity of seed available for collection would likely remain the same or slightly increase in the long term with the greater frequency and extent of fire. With the restoration of vegetation resilience and return to historical fire regimes and condition classes, impacts to woodland vegetation would be reduced when fires occur.

*Special Designations.* There is no fuelwood potential within the three existing ACECs established in Lincoln County. The designation of 18 additional ACECs totaling approximately 141,400 acres would not affect the availability of woodland and native plant products.

**Conclusion.** Alternative B would expand the number of species permitted for use as fuelwood, posts and poles, and Christmas trees, providing a wider opportunity for personal and commercial use. The increased availability is not likely to affect the overall resource supply for any of the species involved. Availability of woodland products would exceed the expected demand. On a long-term basis, the production of woodland products from restored and resilient communities is expected to exceed current levels.

### Alternative C

**Impacts from Woodland and Native Plant Products Management Direction.** The woodland and vegetation products program would be similar to Alternative A except that more species would be allowed for most uses and fuelwood collection would be allowed District-wide. Alternative C also would allow commercial collection of cacti and succulent plants District-wide, subject to provisions of Nevada state law.

Approximately 3.4 million acres would be available for woodland product use in the District, including approximately 3.0 million acres of pinyon-juniper woodland and approximately 1.2 million acres is pinyon-juniper vegetation that has invaded into low elevation sagebrush communities. In addition, approximately 2,800 acres of aspen and 11,200 acres of High Elevation Conifer communities (Forestland Ecological Site Description – 28BY063) would be available for fuelwood collection. Based on these estimates, the following woodland products would be available within the District:

- 11 to 20 million cords of fuelwood (average production – 3 to 6 cords per acre);
- 15 million Christmas trees (average production – 15 singleleaf pinyon trees per acre; singleleaf pinyon occur within 30 percent of the pinyon-juniper woodlands);
- 51 to 102 million posts and poles (average production – 15 to 30 posts and poles per acre);
- 153 to 306 million pounds of pinyon nuts (average production during favorable years – 150 to 300 pounds per acre);



- 14,000 to 56,000 cords of aspen fuelwood (average production – 5 to 20 cords per acre); and
- 448,000 to 560,000 cords of white and limber pine fuelwood (average production – 40 to 50 cords per acre).

**Other Programs Impacts.** Impacts to woodland and native plant products associated with cultural resource, mineral extraction, and watershed management activities would be the same as or similar to those described for Alternative A. Impacts associated with vegetation, renewable energy, and special designations management activities would be the same as or similar to those described for Alternative B. The following interrelated programs would result in different impacts compared to Alternatives A and B.

*Lands and Realty.* Impacts would be the same as Alternative B, except that approximately 289,000 acres would be designated for possible disposal. Of these, less than 20 percent would be woodland.

*Travel and Off-highway Vehicle Use.* Impacts would be similar to those described for Alternative B, except that approximately 734,000 acres would be designated as off-highway vehicle emphasis areas. Implementation of Alternative C would greatly reduce the area open to off-road activities from the current management situation. This would not be consistent with allowing fuelwood to be collected District-wide because only the fuelwood within extremely short distances of roads would be accessible.

*Fire Management.* The suppression of fire would increase the availability of pinyon-juniper woodland for woodland product harvesting in the short term and in the long term until these areas burn. However, the long-term increase in natural fuels would increase the probability of widespread wildfires within the District, which may ultimately reduce the availability of pinyon-juniper woodland for woodland product harvesting.

**Conclusion.** Alternative C would expand the number of species permitted for use as fuelwood, posts and poles, and Christmas trees and areas in which these products could be collected, thus, providing a greater opportunity for personal and commercial use. The increased availability is not likely to affect the overall resource supply for any of the species involved. Availability of woodland products would exceed the expected demand until major fires eliminated large blocks of pinyon-juniper woodlands.

#### Alternative D

**Impacts from Woodland and Native Plant Products Management Direction.** Program-specific management activities would not allow the consumptive harvest of woodland and native plant products, except for pinyon nut harvesting for personal use (including American Indians) and hand collection of seeds for personal use. Thus, the supply of woodland and native plant products would increase over the long term. However, the majority of these products would not be available for public use.

Approximately 3.6 million acres of woodland products would be present on the District. Based on this estimate, the following woodland products would be available within the District subject to other management constraints and direction imposed by this alternative:



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- 11 to 22 million cords of fuelwood (average production – 3 to 6 cords per acre);
- 15 million Christmas trees (average production – 15 singleleaf pinyon trees per acre; singleleaf pinyon occur within 30 percent of the pinyon-juniper woodlands);
- 54 to 108 million posts and poles (average production – 15 to 30 posts and poles per acre); and
- 150 to 300 million pounds of pinyon nuts (average production during favorable years – 150 to 300 pounds per acre).

**Impacts from Other Programs.** Impacts to woodland and native plant products associated with vegetation, cultural resources, lands and realty, renewable energy, watersheds, and special designations management activities would be the same as or similar to those described for Alternative A.

*Travel Management and Off-highway Vehicle Use.* Under Alternative D, off-highway vehicle use would be restricted to existing designated roads and trails. This would be a substantial reduction in area open to such use as compared to the other alternatives. This constraint would impose limitations on the areas accessible for woodland product harvest.

*Mineral Extraction.* Alternative D would eliminate most mineral sales and leases, substantially reducing the level of mineral exploration and development. This would substantially reduce potential impacts from such activities on woodlands and the harvest of woodland products.

*Fire Management.* Fire management under Alternative D would involve minimal suppression activities. This, coupled with the likely increase in invasive species and current presence of overmature pinyon-juniper woodlands would result in a high risk of catastrophic fire events that would remove considerable acreages of woodlands and result in conversion of these areas to the herbaceous state. With the increase of annual grasses and weeds, fire occurrence would increase, and the reestablishment of woodland and native plant species would be hindered.

**Conclusion.** It is highly probable that major fires at an early date under this alternative would substantially reduce the long-term supply of woodland products. However, the harvest constraints under Alternative D also would drastically reduce the demand.

### Alternative E

**Impacts from Woodland and Native Plant Products Management Direction.** Impacts to woodland and native plant products associated with program-specific management activities would be the same as described for Alternative B, with the exception of impacts related to fuelwood and commercial seed collection, which would be similar to Alternative A.

Woodland product estimates available under Alternative E would be the same as those described for Alternative B.

**Impacts from Other Programs.** Impacts to woodland and native plant products associated with cultural resources and watershed management activities would be the same as described for Alternative A. Impacts



associated with vegetation, lands and realty, renewable energy, travel and off-highway vehicle use, mineral extraction, fire management, and special designation activities would be the same as described for Alternative B.

**Conclusion.** Alternative E would expand the number of species permitted for use as fuelwood, posts and poles, and Christmas trees, providing a greater opportunity for personal and commercial use. The increased availability is not likely to affect the overall resource supply for any of the species involved. Availability of woodland products would continue to exceed the expected demand on a long-term basis. On a long-term basis, the production of woodland products from restored and resilient communities is expected to exceed current levels.







## 4.18 Geology and Mineral Extraction

Geological resources are not dealt with as a separate management issue. Geological resources either are managed under special designations for unique geological features (see Section 4.7, Special Designations) or under mineral development, as discussed in this section. The major impact issues for the minerals program are impacts of management actions and decisions on the availability of lands for minerals development. Other impacts involve restrictions on land use and activities. These impacts vary depending on the type of minerals that would be developed. For leasable minerals, there are withdrawals of lands from leasing and there are several categories of restrictions. For locatable and saleable minerals, management decisions by other resource programs would result in either lands being open to mineral development or lands closed to mineral development.

### 4.18.1 Leasable Minerals

#### Impact Issues

**Fluid Minerals.** The impact issues for fluid minerals result from the management decisions for the protection of other resources. There are several categories of restrictions on fluid minerals that are a consequence of protecting those other resources. The categories include: 1) areas open to leasing, subject to standard lease terms and conditions; 2) areas open to leasing, subject to minor constraints; 3) areas open to leasing, subject to major constraints such as no surface occupancy; and 4) areas closed to leasing.

The levels of restrictions from “open subject to standard lease terms and conditions” to “closed” have varying levels of impacts on the exploration and development of fluid minerals. The standard lease terms and conditions are provided on BLM’s fluid mineral lease form. The restrictions for fluid minerals are often provided in the form of stipulations. All other



Oil/Gas Drilling  
Photo by Mark Barber

mineral exploration and development are governed by the standard terms and conditions for mineral development as described in Appendix L. The alternatives have varying degrees of restrictions, but there also are management directions that are common to all alternatives. Detailed discussions regarding restrictions and closures proposed for each alternative, management that is common to all of the alternatives, and stipulations for each alternative are presented in Section 2.4.2.7, Details on Management Direction.



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Geophysical exploration operations would be conducted under standard practices and procedures; however, such operations may have additional proposed requirements depending on alternative. The standard practices and procedures for geophysical exploration operations are described in Appendix L. Section 2.5.18 describes what additional requirements are proposed for the various alternatives.

The various alternatives would affect fluid mineral development by generally varying the amounts of land available for leasing and terms and conditions and standard operating practices and procedure for each alternative. Impacts of restrictions can range from major (loss of minerals and revenues as a result of closure of lands to development) to negligible (activities conducted under standard lease terms and conditions).

The restrictions placed on fluid mineral development to protect other resources can result in impacts that range from negligible to major. Lands open to leasing under standard terms and conditions would represent negligible impacts to fluid minerals while closure of lands to fluid mineral leasing poses major impacts, mainly the loss of the fluid mineral resource. There are several ways to protect other resources during fluid mineral exploration and development: lease stipulations, lease notices, conditions of approval, and discretionary or statutory closures.

A major disadvantage of lease stipulations (especially for wildlife protection) is that changing conditions over time may cause the restrictions to be ineffective or meaningless because of changing populations or habitat. Often stipulations can be redundant in that the requirements are identical to existing regulations or statutes that the lease operators have to comply with in the course of conducting operations. Stipulations also can be used to block mineral related activities. The existence of large contiguous blocks of leases with severe restrictions such as no surface occupancy can act as a de-facto deterrent to leasing and loss of recoverable mineral resources.

The lease stipulations result from the input of other resource managers concerning the best way to minimize impacts of fluid minerals development on those resources. The lease stipulations can be developed for the protection of a number of resources and include protections for archeological, cultural, lands and realty, paleontological, recreation, special status species, vegetation, visual, water resources, wild horses, and wildlife resources. The requirements of the stipulations can include, but are not limited to, restrictions on seasonal access, designation of buffers around sensitive areas, or require other activities that would be critical to protecting a particular resource. Stipulations can be in effect regardless of whether the protected resources are actually present. For example, animal populations fluctuate and from the time that stipulations were developed to the time a lease is issued, the animals may have died out or left the lease area. Conversely, animals may move into areas not previously occupied. If conditions on a lease have changed, lessees can apply for an exception or modification. Section 2.5.18 provides descriptions of the stipulations for the conduct of fluid minerals activities on the Ely District.

Lease stipulations can be revised in three ways: the granting of a waiver (a permanent exemption); issuance of the temporary exemption; or modification of lease provisions (temporary or permanent). However the process for exemptions may not be uniform or well defined (National Academy of Sciences 1989). The ill-defined process for the granting of exceptions can have negative consequences. The granting of too



many exemptions may lessen the validity of the stipulations and arbitrary denials for exemptions could lead to excessive and unnecessary litigation.

Closing of particular areas also can be used to protect resources. Areas may be closed to fluid mineral leasing because of statutory requirements. For example, Wilderness Study Areas are closed to mineral entry until such time as an area is dropped from consideration. If a Wilderness Study Area is elevated to wilderness, then it would continue to be closed to mineral development. Others areas can be closed to fluid minerals leasing because of cultural resources (town sites and institutions) or as part of an ACEC designation. The designation of an area as an ACEC would not necessarily preclude that area from mineral development and certain activities still may be allowed. The specific kinds of activities that may be permitted in ACECs vary according to alternative and are described in Section 2.5.18.

**Solid Leasable Minerals.** The solid leasable category includes minerals such as coal, oil shale, phosphorus, and sodium. The Ely District has few if any commercially extractable solid leasable mineral resources. However, planning must consider possible leasing for each of the alternatives. The impact issues for solid leasable minerals result from the management decisions for the protection of other resources that could result in the closure of lands available for solid leasable mineral leasing.

### Assumptions for Analysis

The following summarizes the fluid mineral development potential in the Ely District based on reasonable foreseeable development scenarios for oil and gas and geothermal energy and were developed in conformance with BLM Instruction Memorandum No. 2004-089 (BLM 2004b). This analysis is presented in detail in the fluid minerals technical report prepared for the RMP/EIS (ENSR 2004). It is impossible to predict with certainty how resource development would occur in the future. The interaction of prices, markets, technology, and environmental concerns all play a role. The reasonable foreseeable development scenarios were developed based on past exploration activities and reasonable estimates of future exploration and development activity given the potential occurrence of the resources.

- There would be no major regulatory changes in federal or state statutes, regulations, policy, and guidance that govern the exploration and development of fluid minerals, including lease royalty provisions and lease rental fees.
- Recent historic highs in the price of oil may stimulate exploration activity above levels of the recent past. It is possible that higher prices may persist for the next few years. The reasonable foreseeable development scenario (ENSR 2004) is a planning tool that was developed to accommodate the maximum development that could reasonably be expected to occur. However, actual activity levels, as with prices, cannot be predicted with certainty.
- As of March 2004, there were 473 federal oil and gas leases covering approximately 1.2 million acres in the Ely District. It is anticipated that the amount of federal oil and gas acreage under lease in the Ely District would range between 1.2 and 1.5 million acres.



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- Based on 2000 to 2004 numbers, additional annual federal acreage leased is projected to average 219,745 acres. It cannot be predicted at this time how much acreage eventually would be held by production, which is entirely dependent on the discovery of commercial oil and gas fields.
- Based on past drilling and discovery history, most of the exploration is likely to occur in the valley floors (**Map 4.18-1**). The high development potential valleys would receive 95 percent of the projected exploration wells. Producing fields would be similar in size and surface disturbance to the Trap Springs and Kate Springs oil fields within Railroad Valley.
- As shown on **Table 4.18-1**, a total of 448 wells would be drilled resulting in total short-term disturbance of approximately 7,100 acres and a long-term disturbance of approximately 1,100 acres. Short-term disturbance as defined for the reasonably foreseeable development scenario includes areas that would be reclaimed immediately after drilling or construction as well as those areas that would be reclaimed and would include locations for wells in the plugged and abandoned category.

**Table 4.18-1**  
**Summary of Surface Disturbance Resulting from Anticipated**  
**Oil and Gas Well Drilling Activity**

Facility Type	Number or Facilities	Short-term Disturbance Factor <sup>1</sup>	Long-term Disturbance Factor <sup>1</sup>	Short-term Disturbance (acres)	Long-term Disturbance (acres)
<b>Exploratory Well Disturbance</b>					
Exploratory well pads	200 wells	3.7 acres/well	1.5 acres/well	740	30
Exploratory well access roads	1,000 miles	4.8 acres/mile	2.9 acres/mile	4,800	290
<b>Total Disturbance for Exploration Drilling</b>				<b>5,540</b>	<b>320</b>
<b>Small Field Development</b>					
Active well pads <sup>2</sup>	40 wells	3.7 acres/well	1.5 acres/well	148	60
Abandoned well pads	48 wells	3.7 acres/well	0	178	0
Central processing facilities	4 facilities	0	5 acres/facility	0	20
Access roads	24 miles	6.3 acres/mile	4.4 acres/mile	151	106
Service roads	32 miles	4.8 acres/mile	2.9 acres/mile	154	93
Pipelines	8 miles	1.8	0	14	0
Gravel pits	4 pits	0	20 acres/pit	0	80
<b>Total Disturbance, Development of Four Small Fields</b>				<b>645</b>	<b>359</b>
<b>Large Field Development</b>					
Active well pads	100	3.7 acres/well	1.5 acres/well	370	150
Abandoned well pads	60	3.7 acres/well	0	222	0
Central processing facilities	4 facilities	0	5 acres/facility	0	20
Access roads	12 miles	6.3 acres/mile	4.4 acres/mile	76	53
Service roads	43 miles	4.8 acres/mile	2.9 acres/mile	206	125
Pipelines	10 miles	1.8 acres/mile	0 acre/mile	18	0
Gravel pits	2 pits	0	42 acres/pit	0	84
<b>Total Disturbance, Development of Two Large Fields</b>				<b>892</b>	<b>432</b>
<b>Associated Facilities</b>					
Refinery	1 Facility	0	20 acres/site	0	20
Refinery pipeline	25 miles	1.8 acres/mile	—	45	—
<b>Total Disturbance for Associated Facilities</b>				<b>45</b>	<b>20</b>
<b>Total Disturbance</b>				<b>7,122</b>	<b>1,131</b>

<sup>1</sup>BLM 1999e and 1992.

<sup>2</sup>Active wells include producers, injectors, and disposal wells.



- Geothermal development potential is moderate in the valley areas and low in the mountain areas (Map 4.18-2). The moderate potential areas cover about 49 percent of the Ely District. Table 4.18-2 summarizes the disturbances resulting from geothermal development, which would total about 250 acres.

**Table 4.18-2**  
**Summary of Surface Disturbance from Anticipated Geothermal Project Development**

Types of Facilities	Number of Facilities	Short-term Disturbance Factor	Long-term Disturbance Factor	Short-term Disturbance (acres)	Long-term Disturbance (acres)
Geothermal gradient well pads	30 wells	0.07 acre/well	N/A	2	—
Gradient well access roads	5 miles	4.8 acres/mile	N/A	24	—
Exploratory well	1 well	3.7 acres/well	1.5	4	1
Exploratory well roads	5 miles	4.8 acres/mile	2.9 acres/mile	24	14
Development well pads	2 wells	3.7 acres/well	1.5 acres/well	7	3
Development well roads	6 miles	6.3 acres/mile	4.4 acres/mile	38	26
Power plant	1 plant plus ancillary facilities	N/A	40 acres/plant and facilities	—	40
Pipelines	8 miles	1.8 acres/miles	0	15	0
Electrical transmission lines	50 miles	—	1.0 acre/mile	—	50
<b>Total</b>				<b>114</b>	<b>134</b>

N/A – Not applicable.

- As of March 2004, the geothermal leasehold in the Ely District is approximately 1,000 acres in a single lease. Geothermal leasing in the future is not expected to greatly increase in the short term, but potential exists for a variety of low-temperature geothermal uses.
- Very limited geothermal exploration and development are expected in the short term.
- If geothermal resources are discovered, the reasonably foreseeable development scenario assumes the maximum development would consist of a power plant within a 10- to 15-megawatt generating capacity and associated greenhouse or dehydration facilities.
- Geothermal exploration could take 5 years, development could take 2 to 10 years, and production could last for 30 years.
- There would be no major regulatory changes in federal or state statutes, regulations, policy, and guidance that govern the exploration and development of solid leasable minerals. Although there is a small probability that such minerals are present in commercially exploitable deposits, the Ely Field Office would provide a program for the development of such commodities if solid leasable minerals are found to be commercially developable.



## 4.0 ENVIRONMENTAL CONSEQUENCES

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### Interactions with Other Programs

The leasable minerals management program of the Ely District is not affected by actions of the other resource management programs.

**Goal 1 – Allow for meeting the Nation's energy needs while providing environmentally responsible production of fluid leasable minerals, and geophysical exploration for energy resources on Public Lands.**

### Alternative A

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative A, approximately 7.75 million acres would be available for leasing under standard terms and conditions (Appendix L). Approximately 2.29 million acres would be available to leasing subject to minor constraints and 231,200 acres would be available to leasing subject to major constraints. About 1.1 million acres would be closed to leasing (see **Map 2.4-41**), primarily on a non-discretionary basis for designated wilderness and Wilderness Study Areas and not subject to management decisions of the Ely Field Office. The discretionary closure of the land would have a negligible impact on the exploration and development of fluid minerals.

Geophysical exploration would be conducted under the standard practices and procedures described in Appendix L, but Notices of Intent submitted for the conduct of geophysical surveys would be evaluated on case-by-case basis.

As discussed in the impacts issues section, provisions to protect the resources of a number of other programs have been incorporated into the management direction for fluid minerals development. This management direction, which is part of the minerals program and not the other resource programs, is expressed as stipulations or standard operating procedures, applicable to all alternatives that have varying degrees of impact on the recovery of potential fluid mineral resources. The impacts of this minerals management direction can vary from minor to major depending on the degree of resource protection that is specified in any particular stipulation, standard operation procedure, or closure. However, based on areas which are closed in comparison to the areas open to leasing under standard terms and conditions, impacts of the restrictions would be minor, since most of the total area that is closed to mineral entry is because of wilderness status.

**Impacts from Other Programs.** As discussed above, the minerals program is affected by provisions to protect other resources through incorporation into management direction. This direction is expressed in stipulations or standard operating procedures that have varying degrees of impact on the recovery of fluid minerals. Thus, the minerals program is affected by management direction common to all alternatives from other resource programs.

**Conclusion.** The total acreage open to fluid mineral leasing would be about 90 percent of the District. Most of the closed areas are non-discretionary closures for designated wilderness or Wilderness Study Areas and



not subject to the management of the Ely Field Office. Proposed discretionary closures would be less than 0.5 percent of the District.

### **Alternative B**

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative B, approximately 1.1 million acres would be available for leasing under standard terms and conditions, 446,000 acres would be available to leasing subject to minor constraints, and 36,100 acres would be available to leasing subject to major constraints. About 8.6 million acres would be subject to programmatic lease stipulations for wildlife and cultural resources (**Map 2.4-42**). Approximately 1.2 million acres would be closed to leasing, primarily on a non-discretionary basis for wilderness study and not subject to management decisions of the Ely Field Office. The closure of the lands described would have a negligible impact on the exploration and development of fluid minerals. Relative to Alternative A, Alternative B would allow more leasing under standard terms and conditions. By allowing greater access to the resource, management direction would facilitate the potential recovery of the resource.

Geophysical exploration would not occur in areas closed to leasing or designated as No Surface Occupancy. Where allowed, geophysical exploration would be subject to the standard practices and procedures as described in Appendix L. Geophysical exploration would be more restricted as compared to Alternative A, since geophysical surveys would not be allowed in closed and no surface occupancy areas.

**Impacts from Other Programs.** As described under Alternative A, the minerals program is affected primarily by stipulations and standard operating procedures applicable to all alternatives, and would not be adversely affected by additional management direction unique to the other resource programs within this alternative.

**Conclusion.** The total acreage open to fluid mineral leasing would be about 89 percent of the District. Most of the closed areas are non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be less than 2 percent of the District.

### **Alternative C**

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative C, 4.1 million acres would be available for leasing under standard terms and conditions, 228,000 would be available subject to programmatic lease stipulations, 5.7 million acres would be available to leasing subject to minor constraints, 56,600 acres would be available to leasing subject to major constraints, and 1.4 million acres would be closed to leasing (see **Map 2.4-43**). The closure of the lands described would have a negligible impact on the exploration and development of fluid minerals. Relative to Alternatives A, B, and E, Alternative C would offer much fewer acres available for leasing under standard terms and conditions and more acreage open to leasing subject to minor constraints. However, since the amount of closed acres almost would be the same as under Alternative A, access to the resource would not change to any great degree under this alternative.



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Geophysical exploration would be considered in areas closed to leasing or designated No Surface Occupancy and timing restrictions. Impact analyses would be conducted on a site-specific basis. Geophysical exploration would be subject to the standard practices and procedures as described in Appendix L. Under Alternative C, geophysical exploration would be considered over leases with timing restrictions, No Surface Occupancy, or closures. As a result, this alternative would provide for greater geophysical exploration/development potential.

**Impacts from Other Programs.** As described under Alternative A, the minerals program is affected primarily by stipulations and standard operating procedures applicable to all alternatives, and would not be adversely affected by additional management direction unique to the other resource programs within this alternative.

**Conclusion.** The total acreage open to fluid mineral leasing would be about 87 percent of the District. Most of the closed areas are non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be about 3 percent of the District and are due to additional acreage closed for community land withdrawals.

### Alternative D

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative D, approximately 11.4 million acres would be close to leasing. The closure of many areas that have a high potential for fluid minerals (especially oil and gas), would have a major impact on those resources because of the unavailability of the resources and consequent potential losses in government royalties and revenue.

Geophysical exploration would not necessarily be conducted under the standard practices and procedures described in Appendix L, and Notices of Intent submitted for the conduct of geophysical surveys would be evaluated on case-by-case basis.

**Impacts from Other Programs.** The extensive closure of lands described above would adversely affect the exploration and development of fluid minerals. The substantially greater areas closed to leasing would be directly related to protection of other resources.

**Conclusion.** The entire District would be closed to new leasing, but existing leases would be honored. The effects would be to preclude exploration and development (except on existing leases) and result in the loss of the resource available to the country, loss of potential lease bonus and rental revenue, loss of potential production royalties and property taxes, and other losses to related economic activity in the District. If no discoveries are made on existing leases, the leases would expire over time resulting in a total cessation of fluid mineral activities.



### Alternative E

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative E, approximately 1.1 million acres would be available for leasing under standard terms and conditions, 448,300 acres would be available to leasing subject to minor constraints, and 40,000 acres would be available to leasing subject to major constraints (see **Map 2.4-44**). The programmatic stipulations for wildlife and cultural resources would be the same as Alternative B. About 1.2 million acres would be closed to leasing. The closure of the lands described would have a negligible impact on the exploration and development of fluid minerals. Relative to Alternative A, Alternative E would provide more acres for lease under standard terms and conditions. The amount of acreage that would be closed would be comparable to Alternative A.

Geophysical exploration would be conducted under the standard practices and procedures described in Appendix L, but Notices of Intent submitted for the conduct of geophysical surveys would be evaluated on case-by-case basis.

**Impacts from Other Programs.** As described under Alternative A, the minerals program is affected primarily by stipulations and standard operating procedures applicable to all alternatives, and would not be adversely affected by additional management direction unique to other resource programs within this alternative.

**Conclusion.** The total acreage open to fluid mineral leasing would be about 89 percent of the District. Most of the closed areas are non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed closures would be about 1 percent of the District.

**Goal 2 – The development of solid leasable minerals would occur in a manner to prevent undue and unnecessary degradation.**

### Alternative A

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative A, about 10.3 million acres would be open to solid leasable mineral leasing and 1.2 million acres would be closed. Most of the closed acreage would involve Wilderness Study Areas (about 1.1 million acres), while 61,000 acres would be closed in areas outside of the Wilderness Study Areas (see **Map 2.4-45**). The closure of the lands described would have a minor impact on the exploration and development of solid leasable minerals.

**Impacts from Other Programs.** As described for fluid minerals, protection of other resources has been incorporated into the management direction for the minerals program. Thus, the minerals program would not be adversely affected by additional management direction unique to other resource programs within this alternative.



## 4.0 ENVIRONMENTAL CONSEQUENCES

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**Conclusion.** The total acreage open to solid mineral leasing would be about 90 percent of the District. Most of the closed areas are non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be about 0.5 percent of the District.

### Alternative B

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative B, approximately 10.1 million acres would be open to solid minerals leasing and 1.3 million acres would be closed. The closed acreage would include about 1.1 million acres of Wilderness Study Areas and an additional 203,400 acres outside of these areas (see **Map 2.4-46**). The closure of the lands described would have a minor impact on the exploration and development of solid leasable minerals. In comparison to Alternative A, Alternative B would provide slightly less acreage available for solid mineral leasing.

**Impacts from Other Programs.** As described for fluid minerals, protection of other resources has been incorporated into the management direction for the minerals program. Thus, the minerals program would not be adversely affected by additional management direction unique to other resource programs within this alternative.

**Conclusion.** The total acreage open to solid mineral leasing would be about 89 percent of the District. Most of the closed areas would be non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be slightly less than 2 percent of the District.

### Alternative C

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative C, approximately 9.9 million would be open to solid minerals leasing and 1.5 million acres would be closed. Slightly less acreage would be available for leasing than under Alternative A (see **Map 2.4-47**). The closure of the lands described would have a minor impact on the exploration and development of solid leasable minerals.

**Impacts from Other Programs.** As described for fluid minerals, protection of other resources has been incorporated into the management direction for the minerals program. Thus, the minerals program would not be adversely affected by additional management direction unique to other resource programs within this alternative.

**Conclusion.** The total acreage open to solid mineral leasing is about 87 percent of the District. Most of the closed areas are non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be slightly less than 4 percent of the District and is due to additional acreage closed for community land withdrawals.



### **Alternative D**

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative D, approximately 11.4 million acres would be closed to solid leasable minerals (including 1.1 million acres in wilderness study areas). The closure of a large portion of the District would have a major impact on access and development of solid leasable mineral resources.

**Impacts from Other Programs.** The extensive closure of lands for the protection of other resources would affect solid leasable minerals.

**Conclusion.** The entire District would be closed to leasing of solid minerals and discretionary closures would comprise almost 91 percent of the District. The closures would preclude development of solid mineral resources.

### **Alternative E**

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative E, approximately 10.2 million acres would be available to solid leasable minerals and 1.2 million acres would be closed. Of the closed acreage, 1.1 million acres would be in Wilderness Study Areas (see **Map 2.4-48**). The closure of the lands described would have a minor impact on the exploration and development of solid leasable minerals.

**Impacts from Other Programs.** As described for fluid minerals, protection of other resources has been incorporated into the management direction for the minerals program. Thus, the minerals program would not be adversely affected by additional management direction unique to other resource programs within this alternative.

**Conclusion.** The total acreage open to solid mineral leasing would be about 89 percent of the District. Most of the closed areas would be non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be about 1 percent of the District.

## **4.18.2 Locatable Minerals**

### **Impact Issues**

The impact issues for locatable minerals are associated with the management decisions for the protection of other resources, which could result in the proposed withdrawal of lands available for locatable mineral exploration and development. Other issues include restrictions governing locatable mineral exploration and development.



## 4.0 ENVIRONMENTAL CONSEQUENCES

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### Assumptions for Analysis

- There would be no major regulatory changes in federal or state statutes, regulations, policy, or guidance that govern the exploration and development of locatable minerals.
- Commodity prices in the future would provide sufficient economic incentive to support the production of locatable mineral commodities.
- The most probable locations for the development of locatable minerals would be in areas of previous production or documented mineralization.
- Surface mining is expected to remain the primary method of locatable mineral resource extraction in the Ely District.
- It is anticipated that one large open-pit mine would be developed during the next 20 years. A large open-pit mine often consists of either one large pit or a number of smaller pits in close proximity to one another. It is assumed that the mine would encompass about 3,000 acres including pits, waste rock piles, processing facilities, roads, exploration drill pads and roads, and office facilities along with vehicle repair shops.
- It is anticipated that three medium sized open-pit mines would be developed during the next 20 years. The mines would consist of one pit, waste rock dumps, an ore processing area, a heap leach pad, roads, ore stockpiles. Each medium open-pit mine would disturb about 700 acres resulting in a total disturbance of 2,100 acres.
- It is expected that as many as six small mines would be developed during the next 20 years. The mines each would consist of small pits; one waste rock pile; one leach pad; and roads, processing facilities, and a small office. Each small mine would cover an area of 400 acres resulting in a total disturbance of 2,400 acres.
- Total disturbance from locatable mining development associated with the above operations would be approximately 7,500 acres.

### Interactions with Other Programs

The locatable minerals management program of the Ely District is not affected by actions of the other resource management programs.

**Goal – Allow development of locatable minerals in a manner to prevent undue and unnecessary degradation.**



### **Alternative A**

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative A, about 10.3 million acres would be open to locatable mineral development and 1.1 million acres would be proposed for withdrawal including about 61,000 acres outside of Wilderness Study Areas (see **Map 2.4-45**). The discretionary withdrawal of the lands described would have a negligible impact on the exploration and development of locatable minerals.

**Impacts from Other Programs.** As described for fluid minerals, protection of other resources has been incorporated into the management direction for the minerals program. Thus, the minerals program would not be adversely affected by additional management direction unique to other resource programs within this alternative.

**Conclusion.** The total acreage open to locatable minerals would be about 90 percent of the District. Most of the withdrawn areas would be non-discretionary withdrawals for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary withdrawals would be about 0.5 percent of the District.

### **Alternative B**

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative B, about 10.1 million acres would be open to locatable mineral development and 1.3 million acres would be proposed for withdrawal to mineral entry. The withdrawal acreage would include about an additional 203,400 acres outside of Wilderness Study Areas (see **Map 2.4-46**). Alternative B would offer slightly less acres available for locatable mineral entry than Alternative A. The withdrawal of the lands described would have a minor impact on the exploration and development of locatable minerals.

**Impacts from Other Programs.** As described for fluid minerals, protection of other resources has been incorporated into the management direction for the minerals program. Thus, the minerals program would not be adversely affected by additional management direction unique to other resource programs within this alternative.

**Conclusion.** The total acreage open to locatable minerals would be about 89 percent of the District. Most of the withdrawn areas would be non-discretionary withdrawals for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary withdrawals would be slightly less than 2 percent of the District.

### **Alternative C**

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative C, about 9.9 million acres would be open to locatable mineral development and 1.5 million acres would be proposed for withdrawal. The withdrawal acreage would include 410,400 acres withdrawn from mineral entry outside



## 4.0 ENVIRONMENTAL CONSEQUENCES

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of Wildemess Study Areas (see **Map 2.4-47**). The withdrawal of the lands described would have a minor impact on the exploration and development of locatable minerals.

**Impacts from Other Programs.** As described for fluid minerals, protection of other resources has been incorporated into the management direction for the minerals program. Thus, the minerals program would not be affected by additional management direction unique to other resource programs within this alternative.

**Conclusion.** The total acreage open to locatable minerals would be about 87 percent of the District. Most of the withdrawal areas would be non-discretionary withdrawals for designated wildemess or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary withdrawals would be slightly less than 4 percent of the District and are due to additional acreage closed for community land withdrawals.

### Alternative D

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative D, approximately 4.2 million acres would be open to locatable mineral development. Approximately 7.2 million acres would be proposed for withdrawal to locatable mineral development, including 6.1 million acres outside of the Wildemess Study Areas (see **Map 2.4-49**). The withdrawal of the lands described would have a major impact on the exploration and development of locatable minerals.

**Impacts from Other Programs.** The extensive withdrawal of lands for the protection of other resources would affect locatable minerals.

**Conclusion.** The acreage open to locatable minerals would be about 37 percent of the District. Discretionary withdrawals would be about 63 percent of the district. The withdrawal of almost two-thirds (including non-discretionary withdrawals) of the District would cause severe limitations on access to potential developable locatable mineral deposits. Inability to explore and develop locatable minerals would result in loss of the resource to the country, loss of tax revenue, and other losses to related economic activity in the District.

### Alternative E

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative E, approximately 10.2 million acres would be open to locatable mineral development and 1.2 million acres would be proposed for withdrawal. The proposed for withdrawal acreage would include 158,800 acres outside of the Wilderness Study Areas (see **Map 2.4-48**). The withdrawal of the lands described would have a minor impact on the exploration and development of locatable minerals.

**Impacts from Other Programs.** As described for fluid minerals, protection of other resources has been incorporated into the management direction for the minerals program. Thus, locatable minerals would be minimally affected by management direction from other resource programs.



**Conclusion.** The total acreage open to locatable minerals would be about 89 percent of the District. Most of the proposed withdrawal areas would be non-discretionary withdrawals for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary withdrawals would be about 1 percent of the District.

### **4.18.3 Saleable Minerals**

#### **Impact Issues**

The impact issues for saleable minerals are associated with the management decisions for the protection of other resources that could result in the closure of lands available for saleable mineral exploration and development. Other impacts may result from restrictions governing saleable mineral exploration and development.

#### **Assumptions for Analysis**

- There would be no major regulatory changes in federal or state statutes, regulations, policy, or guidance that govern the exploration and development of saleable minerals.
- The demand for saleable minerals (specifically sand and gravel) would increase because of growth in the Ely District and Clark County. In spite of the long haulage distances, saleable minerals from the Ely District would be competitive with sources closer to Las Vegas. In the near term, the most likely areas to have development of sand and gravel deposits would be in southern Lincoln County.
- The Nevada Department of Transportation would continue to mine gravel resources for road maintenance and construction. The exact location of the pits used by the Nevada Department of Transportation would be dictated by specific construction and maintenance needs.
- Demand for other saleable minerals (building stone, perlite, decorative rock, and pumice) would depend on market conditions and demand.

#### **Interactions with Other Programs**

The saleable minerals management program of the Ely District is not affected by actions of the other resource management programs.

**Goal – Allow development of saleable minerals in a manner that would prevent undue and unnecessary degradation, meet public demand, and minimize adverse impacts to other resource values.**



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### Alternative A

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative A, approximately 10 million acres would be open to possible disposal for saleable mineral development, but subject to best management practices and the standard operating procedures described in Appendix L. Another 1.4 million acres would be closed to saleable mineral development, including 288,100 acres outside of Wilderness Study Areas (see **Map 2.4-50**). The closure of the lands described would have a negligible impact on the disposal of saleable minerals.

**Impacts from Other Programs.** As described for fluid minerals, protection of other resources has been incorporated into the management direction for the minerals program. Thus, the saleable minerals program would not be adversely affected by additional management direction unique to other resource programs within this alternative.

**Conclusion.** The total acreage open to saleable mineral disposal would be about 88 percent of the District. Most of the closed areas are non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be about 2.5 percent of the District.

### Alternative B

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative B, about 9.6 million acres would be open to possible disposal for saleable minerals development, but subject to best management practices and standard operating procedures described in Appendix L. Approximately 1.8 million acres would be closed to saleable minerals development, including 760,100 acres outside of Wilderness Study Areas (see **Map 2.4-51**). The closure of the lands described would have a negligible impact on the disposal of saleable minerals.

**Impacts from Other Programs.** As described for fluid minerals, protection of other resources has been incorporated into the management direction for the saleable minerals program. Thus, the saleable minerals program would not be adversely affected by additional management direction unique to other resource programs within this alternative.

**Conclusion.** The total acreage open to saleable mineral disposal would be about 84 percent of the District. Most of the closed areas would be non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be less than 7 percent of the District.

### Alternative C

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative C, about 9.4 million acres would be open to possible disposal for saleable mineral development, but subject to best management practices and the standard operating procedures described in Appendix L. Approximately



2 million acres would be closed to saleable mineral development including 948,800 acres outside of Wilderness Study Areas (see **Map 2.4-52**). The closure of the lands described would have a minor impact on the disposal of saleable minerals.

**Impacts from Other Programs.** As described for fluid minerals, protection of other resources has been incorporated into the management direction for the minerals program. Thus, the minerals program would not be adversely affected by additional management direction unique to other resource programs within this alternative.

**Conclusion.** The total acreage open to saleable mineral disposal would be about 82 percent of the District. Most of the closed areas would be non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be about 8 percent of the District and is due to additional acreage closed for community land withdrawals.

#### **Alternative D**

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative D, 11.4 million acres would be closed to saleable mineral development, including 1.1 million acres in Wilderness Study Areas. The closure of the Ely District to saleable mineral disposal would have a major impact on mineral material resources.

**Impacts from Other Programs.** The extensive closure of lands for the protection of other resources would affect saleable minerals.

**Conclusion.** The entire District would be closed to disposal of saleable minerals and discretionary closures would comprise about 91 percent of the District. The closure would preclude development of saleable mineral resources and result in the loss of the resource to the public and the loss of related economic activity.

#### **Alternative E**

**Impacts from Geology and Mineral Extraction Management Direction.** Under Alternative E, about 9.6 million acres would be open to possible disposal for saleable mineral development, but subject to best management practices and the standard operating procedures described in Appendix L. Approximately 1.8 million acres would be closed to saleable mineral material development, including 716,000 acres outside of Wilderness Study Areas (see **Map 2.4-53**). The closure of the lands described would have a negligible impact on the disposal of saleable minerals.

**Impacts from Other Programs.** As described for fluid minerals, protection of other resources has been incorporated into the management direction for the saleable minerals program. Thus, the saleable minerals program would not be adversely affected by additional management direction unique to other resource programs within this alternative.



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**Conclusion.** The total acreage open to saleable mineral disposal would be about 84 percent of the District. Most of the closed areas would be non-discretionary closures for designated wilderness or Wilderness Study Areas and not subject to the management of the Ely Field Office. Proposed discretionary closures would be slightly more than 6 percent of the District.



## 4.19 Watershed Management

In the past, project proposals would have been developed and implemented based upon boundaries of livestock grazing allotments. The Ely RMP/EIS would implement a policy change that directs BLM to plan and implement decisions based on watershed boundaries.

In the future, watershed analyses will be performed to determine if rangeland health standards are being met within a watershed. This involves an analysis of uses of vegetation by livestock, wildlife, and wild horses as appropriate. It also involves analysis of other uses within the watershed. These include such things as: mineral exploration and/or development, off-highway vehicle use, hunting, and rights-of-way and corridor designations. If rangeland health standards are being met, the restoration plan (a portion of the watershed analysis) will propose projects and resource uses designed to maintain the healthy condition of the watershed. If standards are not being met, the restoration plan will propose projects and resource uses designed to improve the condition of the watershed. Actions designed to enhance habitats for wildlife and special status species would be determined in designing the desired states for vegetation communities. Sometimes this would occur ahead of other watershed analysis activities but would be part of the watershed analysis process.

There are 61 watershed units within the planning area. It is expected that completion of watershed analyses, including restoration plans with proposed projects, on the 32 high priority watersheds would take approximately 10 years. Completion of watershed analyses on the remaining 29 lower priority watersheds would take longer than 10 years as more and more effort would be needed to implement projects proposed on the earlier analyzed watersheds.

### Impact Issues

Future watershed management on the Ely District would focus on the use of active and passive management actions to achieve healthy, resilient, and diverse ecological systems that restore or maintain resiliency of native vegetation to disturbances. As discussed in Section 4.5, Vegetation, where existing vegetation communities are in a resilient state, management actions would be implemented to maintain that resiliency; where they are not presently resilient, efforts would be made to restore resiliency. With the close linkage between watershed health and vegetation, any factors or events affecting vegetation also would affect watersheds. Impacts to watersheds would be similar and closely related to impacts to vegetation.

Active restoration typically involves direct manipulations of vegetation resources in order to reduce shrub composition, tree density, and invasive weed occurrences or to establish a mosaic of various ages and classes of plant communities based on soil parameters. Active restoration measures include such activities as prescribed burning and wildland fire use, mechanical treatment, and seeding (see Appendix E, Tools and Techniques). Passive restoration is focused on management of activities (e.g., livestock grazing) that occur on the watershed in order for ecological processes to achieve or maintain healthy conditions. This is best applied in areas that can be closed to use (e.g., vehicle traffic, grazing, hiking) and that already exhibit a diverse array of desirable plant species. (See Section 4.5, Vegetation, for more discussion of the vegetation treatments.)



Actions designed to enhance wildlife and special status species habitats would be determined in some cases ahead of the watershed analysis. The reader should be aware that actions in all resource programs and uses affect watersheds. This is especially true concerning actions regarding vegetation, fish and wildlife, special status species, wild horses, livestock grazing, fire management and watershed management.

**Allocation of Additional Forage.** Following restoration of resilient vegetation communities, it is expected that forage productivity would improve in most watersheds. Allocation of this increased production would vary among the alternatives as described in **Table 2.4-1**.

**Assumptions for Analysis**

Primary factors for analysis of the alternatives include: 1) the anticipated success or failure and rate of change in functionality of different types of watersheds; 2) amount of short-term and long-term loss or gain in productivity; and 3) conditions and trends related to herbaceous understory composition, shrub cover, and woodland expansion in native plant communities.

- Restoration of watershed health and achievement of desired plant community composition, structure, and function is expected to require several decades.
- Under all alternatives, monitoring would occur at levels commensurate with the amount of vegetation treatment activity implemented, the complexity of the affected environment, and the degree of plant community response demonstrated through prior monitoring.
- Management recommendations derived from state and transition ecological models would be available.
- Weed treatments would be effective and may be implemented in coordination with or independently from the watershed analysis and treatment schedule. All noxious and invasive weed-related assumptions listed in Section 4.21 also are assumed.
- Assumed revegetation success rates by different types of Great Basin vegetation would be as follows:
  - Pinyon-juniper woodland                      70 percent
  - Mountain mahogany                              70 percent
  - Mountain sagebrush                              70 percent
  - Wyoming sagebrush                              50 percent
  - Black sagebrush                                   50 percent
  - Shadscale     30 percent
  - Winterfat     30 percent



### Interactions with Other Programs

The watershed management program within the Ely District is integrally linked with and potentially would be affected by actions within the resource management programs for vegetation, fish and wildlife, special status species, wild horses, lands and realty, livestock grazing, geology and mineral extraction, fire management, noxious and invasive weed management, and special designations.

**Goal – Manage watersheds to restore and maintain resistance and resiliency to disturbances.**

### Alternative A

**Impacts from Watershed Management Direction.** The comprehensive watershed approach being used on the District is the most effective means for addressing large scale, inter-related issues. This approach provides the ability to respond to soil, water, and vegetation trends in a coordinated manner. By approaching land management from a watershed perspective, solutions can be identified that address causal factors for degraded conditions. In this way, investments in short-term solutions that may be effective but not fully developed for long-range implementation can be avoided, and long-term rehabilitation is more likely to be achieved through prioritization of management effort.

Under Alternative A, active and passive watershed restoration activities, including analysis, would be undertaken at a relatively low level with a slow rate of associated change. Watershed analysis and associated monitoring currently are implemented as funding opportunities and other resources allow. Within this alternative the treatment emphasis would continue to occur primarily as fire rehabilitation within the various sagebrush types (see **Maps 4.5-1** and **4.5-2**). Smaller treatment areas would be emphasized in other vegetation types on a case-by-case basis. Watershed treatments would continue to be implemented at rates somewhat above the historic rate of approximately 10,000 acres of vegetation manipulation per year. Vegetation treatments would not be concentrated in any watershed. Thus, the effect on any watershed is small. The majority of activity would continue to be seeding following wildfires. Considering a total treatment area of almost 2.8 million acres across the Great Basin portion of the District, this rate of treatment is not expected to succeed in reestablishing vegetation resiliency. In fact, this historic rate is not considered adequate by BLM managers and the agency's science advisors to keep pace with the apparent rates of decline.

Watershed restoration treatments are diverse and varied, including mechanical and chemical vegetation treatments to reduce tree and shrub cover. Prescribed and natural managed fires also are commonly used to achieve desired vegetation conditions. Tools and techniques that would continue to be used in this and other programs are described in Section 2.3.3.

Plant community response to removal of pinyon and juniper and reduction of shrubs is related to the type and amount of treatment, the residual plant species diversity, and site conditions. Production of grass and forb species generally is expected to increase after tree removal and shrub reductions, except where native perennial grasses are absent or at low densities.



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Some studies have reported post-treatment responses of two to four times the production of perennial grasses on moist soils than on dry and greatest responses on sites with high annual precipitation, deep soils, or high nitrate levels. The proportions of ground cover, perennial grass, and shrub components within sagebrush systems are a function of precipitation, grazing history, soils, and species composition. Therefore, herbaceous plant production, especially grasses, in post-treatment sagebrush communities can be related to historic or current grazing regimes.

In general, perennial grasses are slightly to moderately affected by fire. Bunchgrasses with dense accumulations of leaves and stems at their base, such as needle-and-thread grasses, can be vulnerable to fire. Those that survive fire reportedly can recover within as short as 2 years. As discussed in Section 4.21, Noxious and Invasive Weed Management, fire can proliferate cheatgrass over wide areas.

Big sagebrush and other non-sprouting shrubs, such as curl leaf mountain mahogany, cliffrose, shadscale, and winterfat are almost always killed by fires and may take decades to recover. In contrast, greasewood and rabbitbrush typically resprout following fire.

Fire generally kills pinyon pine and juniper, especially smaller trees. Older trees tend to become more fire resistant as bark thickens. Pinyons and junipers rely on seed reproduction, thus the rate of re-establishment is related to the distance to seed source, fire size, and dispersal agents.

Revegetation success typically is higher in the more mesic, higher elevation vegetation types (e.g., pinyon-juniper, mountain mahogany, and mountain sagebrush). These are some of the types that tend to have a higher relative abundance in the typical small watershed described earlier. On the other hand, the typical larger watersheds tend to include a higher proportion of low elevation vegetation types such as shadscale and Wyoming sagebrush where soils are drier and revegetation success is less probable. In those vegetation types with the lowest probabilities for successful revegetation (e.g., shadscale and winterfat), passive treatment techniques, such as changes in livestock grazing, would be favored in most cases other than rehabilitation of wildfires. Under Alternative A, the treatment emphasis would occur predominantly in the sagebrush types within large watersheds with minor treatment components in salt desert shrub and nonnative seedings. In the sagebrush areas, the average treatment success rate is estimated to be about 50 percent. Active vegetation treatments within the Mojave Desert portion of the District would consist primarily of fire rehabilitation.

### Impacts from Other Programs.

*Vegetation.* The use of both native and nonnative species in reclamation activities (e.g., seeding) potentially can have ecological consequences for the long-term restoration of native plant communities. Several nonnative species, such as crested wheatgrass, have been seeded on a widespread basis throughout the region (also see Section 4.5, Vegetation). In some cases, these species have been more persistent than desired, achieving dominance and effectively slowing or preventing the re-establishment of more desirable native species (Monsen et al. 2004).



*Fish and Wildlife.* Under Alternative A, fish and wildlife needs are a consideration in the establishment of desired range of conditions for vegetation communities, but restoration efforts would focus on only a few of the vegetation communities that presently fail to meet these desired range of conditions. Fish and wildlife values and associated habitat requirements are a substantial factor in the planning and prioritization of watershed treatments and the planning of subsequent management.

*Special Status Species.* None of the proposed management actions regarding special status species are anticipated to affect the watershed program under this alternative. However, if deterioration of watershed and vegetation conditions result in the listing of various sagebrush-obligate species under the Endangered Species Act, the regulatory constraints and mandates related to the vegetation/watershed treatment and restoration program could change dramatically, with the restoration of habitat for such species becoming the primary, if not sole, focus of the program.

*Wild Horses.* Wild horse herds may adversely affect the success of restoration efforts occurring within the herd management areas since it would be difficult, if not impossible, to exclude wild horses from all new seedings. The effect of wild horses on these treatment areas would be most noticeable and negative in those herd management areas where wild horse populations exceed appropriate management levels and inadequate forage exists to sustain the horse populations.

*Lands and Realty.* Various lands and realty actions such as rights-of-way and land disposals could affect the planning and implementation of watershed treatments in terms of either prioritization of or constraints on various treatments.

*Livestock Grazing.* The environmental impacts of grazing are a function of the location, timing, intensity, duration, and frequency of grazing. Grazing animals affect plant communities through herbivory, trampling, and nutrient redistribution. Grazing can stimulate growth in some plants. It also can reduce plant abundance, density, and vigor. Grazing can be used to generate changes in plant community composition, structure, and function. Spatial variations in grazing can influence patterns of the landscape mosaic and dictate when a site switches to an alternative ecological state (crosses a threshold). Through its effects on vegetation, grazing may be used as a tool for meeting standards in watershed management. The specific manner in which livestock grazing would contribute to watershed restoration would be determined during watershed analysis.

*Mineral Extraction.* Mineral development activities may affect the planning and implementation of watershed treatments in terms of either prioritization of or constraints on various treatments.

*Fire Management.* Fire affects the productivity of plants and has a substantial impact on plant competition. Site-specific impacts are a function of weather conditions, time of year, affected plant species, successional stage, fuel moisture, fire severity, depth and duration of heat penetration, and fire frequency. Productivity may decrease initially after fire and then increase after one to several years. Total vegetation productivity may shift from woody plants to herbaceous species. Fire use and prescribed fire may be used as tools in watershed treatments while wildland fires may affect the planning and implementation of watershed treatments in adjacent areas.



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Species responses to fire can range from stimulating sprouts to mortality. Some plants tolerate fire and some require it. The biggest threat to native ecological systems on the Ely District relative to fire management is the continued proliferation of cheatgrass following fire. Current fire management practices take cheatgrass abundance into account, whenever practical.

*Noxious and Invasive Weed Management.* The management of noxious and invasive weeds is essential for restoration of native plant community health and resiliency. The presence and abundance of noxious and invasive weed populations would be important factors in the planning and implementation of watershed treatments. Management to remove, reduce, and prevent noxious weeds would include the use of chemical, mechanical, biological, and cultural methods. The effects of herbicide use vary with the herbicide used, the application rate, and the proximity of non-target plants to targeted ones. The use of cultural agents (e.g., sheep and goats) to manage noxious weeds would affect native and desirable plants to the degree that non-target species are present in the treatment area and are palatable to animals. With implementation of standard operating procedures (see Appendix H), these short-term effects would not be expected to interfere with the accomplishment of long-term restoration objectives.

*Special Designations.* Special designations involving protection of special status species, cultural resources, or scenic viewsheds are likely to constrain vegetation treatments within the immediate vicinity and potentially the whole watershed.

**Conclusion.** Treatments would not occur at a scale and rate adequate to address the magnitude and extent of ecological problems on the District. Thus, the rate of treatment under this alternative, when combined with actions proposed for vegetation, fish and wildlife, special status species, wild horses, livestock grazing, and fire management, has a low probability of achieving noticeable gains in District-wide resiliency.

### Alternative B

**Impacts from Watershed Management Direction.** Under Alternative B, watershed restoration would be accelerated substantially and the area planned for treatment would be based on the ranges of healthy conditions and desired vegetation states identified in Section 2.5.5. Total area planned for active vegetation treatment is approximately 6.2 million acres distributed as follows among the various vegetation types:

- Approximately 44 percent in pinyon-juniper communities that are “overmature” or have understory vegetation dominated by invasive species (see **Table 2.5-1** and **Map 4.5-3**);
- Approximately 50 percent in sagebrush communities invaded by pinyon and juniper (see **Map 4.5-1**), with understory vegetation dominated by invasive species, or having almost no understory vegetation (see **Table 2.5-5**);
- Approximately 4 percent in salt-desert shrub communities dominated by annual invasive or exotic species;



- Approximately 1 percent in nonnative seedlings dominated by shrubs, trees, or annual invasive species; and
- Approximately 1 percent collectively in high elevation conifer, mountain mahogany, and aspen communities in overmature phases.

In addition, management actions, including passive restoration measures, would be implemented in the Mojave Desert communities and in Great Basin communities meeting the desired range of conditions to protect these areas from further deterioration.

As with Alternative A, treatment success of the Great Basin vegetation types is expected to be highest in the higher elevation areas occupied by pinyon-juniper and mountain sagebrush and lowest in the lower elevation areas. This again would represent a higher success rate for the smaller watersheds than most larger ones. Under this alternative, the higher proportion of treatment related to vegetation types with higher success probabilities (i.e., pinyon-juniper) would lead to potentially higher overall success rates than Alternative A. Vegetation treatments as well as other treatments designed to restore vegetation resiliency, improve hydrologic function, increase infiltration, and reduce soil erosion would be concentrated within specific watersheds over time. Additional forage produced as a result of vegetation treatments would not be allocated to either livestock or wild horses, but would be used to improve watershed condition and provide forage for wildlife.

#### **Impacts from Other Programs.**

Under Alternative B, the lands and realty, mineral extraction, and noxious and invasive weed management programs and their associated impacts would be similar to Alternative A. Programs in which the impacts would differ substantially from Alternative A are discussed below.

*Vegetation.* Under this alternative, much of the treatment emphasis would focus on treatment of resources at-risk of crossing thresholds to tree or shrub states with little or no herbaceous understory. Sagebrush and pinyon-juniper woodland areas dominated by or containing an understory component of annual invasive species (e.g., cheatgrass) would typically be rehabilitated if and when they burn naturally. With the shift in treatment emphasis and increase in the level of effort involved, this alternative would produce substantially greater watershed improvements than Alternative A.

*Fish and Wildlife.* Under Alternative B, watershed restoration would be driven, in large part, by wildlife habitat requirements as defined through the desired future conditions.

*Special Status Species.* Under Alternative B, the probability of listing of sagebrush-obligate species under the Endangered Species Act would be substantially reduced by maintenance and restoration of sagebrush vegetation communities. Thus, there would be reduced probability of future species listings guiding the watershed management program.



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*Wild Horses.* The reduction in number and distribution of herd management areas associated with this alternative would help alleviate impacts from wild horses on revegetation efforts and watershed treatments, especially in several drier areas of the District. This also would favor maintenance of treated watersheds in these areas and reduce the potential need for future treatments of the same areas.

*Livestock Grazing.* Under Alternative B, livestock grazing would be eliminated in the remainder of the desert tortoise habitat within the Mojave Desert and within bighorn sheep habitat. This would facilitate passive treatment and restoration of the plant communities and watersheds in these areas totaling 3.5 million acres. Reduced grazing or altered grazing management may be used in other portions of the District to help restore native plant communities on sites that have not crossed major ecological thresholds. On those that have, reduced grazing may have intrinsic value but would not necessarily attain desired vegetation conditions. Livestock grazing also may be used as a tool in meeting watershed treatment and management objectives.

*Fire Management.* The primary difference between this alternative and Alternative A with respect to fire management is that under this alternative, the fire management plan would be modified to achieve greater use of fire as a vegetation management tool, based on the watershed analysis process. This shift would provide more flexibility in the long-term management of the restored watersheds. Restoration of vegetation resilience and return to historical fire regimes and condition classes would result in reduced impacts to watersheds when fires occur.

*Special Designations.* This alternative would involve designation of 18 new ACECs and various other special designations, but it is not expected that these designations would affect the planned watershed analysis and treatment process in any major way although they may affect selection of areas and methods for local vegetation treatments. In some cases, these designations would augment the watershed treatment and management process by providing additional protection from disturbances and facilitating passive restoration treatment.

**Conclusion.** The restoration approach of Alternative B, when combined with the actions proposed for vegetation, fish and wildlife, special status species, wild horses, livestock grazing, and fire management, addresses all of the watershed health management issues on the District with the scale of treatments needed to reverse the historic deterioration in rangeland health and restore vegetation resiliency.

### Alternative C

**Impacts from Watershed Management Direction.** Under Alternative C, the watershed restoration program would involve a potential active treatment area (approximately 7.6 million acres) approximately 22 percent greater than that of Alternative B. Active treatment emphasis in the Great Basin watersheds would be split primarily between non-resilient sagebrush types (about 56 percent) and pinyon-juniper (36 percent) (see **Map 4.5-2** and **4.5-3**, respectively). The anticipated treatment area in salt desert shrub would be about 5 percent of the total, nonnative seedings about 2 percent, and other vegetation types would collectively contribute about 1 percent. Treatments would be oriented toward establishment and maintenance of more herbaceous state sites in this alternative than in Alternative B. This narrower range of desired conditions



would likely require greater effort to establish and more frequent treatments to maintain. Vegetation treatments, as well as other treatments designed to restore resiliency to a watershed, would be concentrated within specific watersheds over time. In addition, management actions, including passive restoration measures, would be implemented in the Mojave Desert communities and in Great Basin communities meeting the range of healthy conditions to protect these areas from further deterioration.

As with the previous alternatives, treatment success of the Great Basin vegetation types is expected to be highest in the higher elevation areas occupied by pinyon-juniper and mountain sagebrush and lowest in the lower elevation salt desert shrub areas. This again would represent a higher success rate for the smaller watersheds than most larger ones.

**Impacts from Other Programs.** Impacts on watershed restoration associated with lands and realty, mineral extraction, and noxious and invasive weed management programs would be the same as described for Alternative A. Impacts associated with fish and wildlife, special status species, wild horses, and special designations management activities would be the same as described for Alternative B. The following interrelated programs would result in different impacts compared to Alternatives A and B.

*Vegetation.* Vegetation treatment areas under Alternative C would generally be similar to Alternative B except that Alternative C would involve greater treatment acreages in all vegetation types except pinyon-juniper. This alternative would focus on a narrower range of healthy conditions defined for the commodity emphasis of this alternative, which may necessitate more frequent future treatments.

*Livestock Grazing.* Livestock grazing would not be removed on the 3.5 million acres of closures associated with Alternative B. Thus, livestock grazing may both be used as a tool in these areas and also affect implementation and success of other vegetation treatments.

*Fire Management.* The full suppression approach to fire management in Alternative C would contribute to the continued accumulation of heavy fuels in untreated areas rendering them more vulnerable to large, intense fires if and when they eventually burn. Restoration of these areas would then be more difficult than if treated or burned in the absence of such heavy fuel loads.

**Conclusion.** When combined with the actions proposed for vegetation, fish and wildlife, special status species, wild horses, livestock grazing, and fire management, treatments would occur at a scale and rate that would reverse the historic deterioration in rangeland health and restore resiliency of vegetation communities. However, the narrower range of desired conditions (with greater emphasis on the herbaceous state) in this alternative as compared to Alternative B would require more effort and more frequent treatments to achieve and maintain. The higher probability for widespread fire over the long term also would necessitate greater efforts for fire suppression and rehabilitation as opposed to planned treatments.

#### **Alternative D**

**Impacts from Watershed Management Direction.** This alternative would be similar to Alternative A in terms of anticipated scale of watershed treatments. However, Alternative D would focus on passive



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restoration, elimination of grazing, use of fewer herbicides, and elimination of all discretionary uses or developments on the public lands. Restoration of native plant communities would emphasize replacement of nonnative plants such as cheatgrass and crested wheatgrass with perennial bunchgrasses, primarily within the Great Basin portion of the District. Restoration of native plant communities would involve maintenance of the current distribution of species. Areas where sagebrush was previously removed would be revegetated with sagebrush, and similarly, pinyon and juniper would be restored on sites where trees have been removed.

This approach would manage public land to achieve no net loss of native communities, as they currently exist or existed about 1950 prior to widespread shrub and tree removal for enhanced forage production. Therefore, in the short term, vegetation conditions would continue generally as they currently exist with gradual increases in forage production and vegetation resiliency in some communities through passive restoration; increased accumulation of fuel loads in almost all unburned communities; and replacement of invasive or nonnative species in limited areas of active treatment.

**Impacts from Other Programs.** Impacts on watershed restoration associated with fish and wildlife, and special designations management activities would be the same as described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Vegetation.* Under this alternative, much of the treatment emphasis would focus on treatment of sites that have understory vegetation dominated by invasive species. This alternative is expected to produce comparable vegetation restoration to Alternative A on individual treated areas, but the focus would be on restoration of native species, not necessarily resilient conditions.

*Special Status Species.* Under Alternative D, the probability of listing of sagebrush-obligate species under the Endangered Species Act may be temporarily reduced by maintenance and restoration of sagebrush vegetation communities. However, over the long term, the substantially higher risks of large intense fires destroying widespread areas of sagebrush habitat would lead to increased probabilities for such listings. Thus, there would be reduced probability of future species listings guiding the watershed management program in the short term and increased probability of such direction over the long term.

*Wild Horses.* Under Alternative D, wild horse populations would be uncontrolled within the herd management areas. This would result in severe impacts to vegetation and watershed health in these areas, creating the need for additional, and probably repeated, treatment.

*Lands and Realty.* Minimal lands and realty actions would occur under Alternative D and effects to watershed management would be absent.

*Livestock Grazing.* Under Alternative D, livestock would be removed from the District, eliminating any conflict between grazing activities and watershed management. However, removal of livestock would eliminate one of the major tools used for vegetation treatment.



*Geology and Mineral Extraction.* Under Alternative D, mineral sales and leasing would not occur, but a portion of the District would remain open to locatable mineral development. The potential effects of such activities to watershed management would be substantially reduced relative to other alternatives.

*Fire Management.* Under Alternative D, minimal fire suppression would occur. Decreased fuel reduction by grazing, followed by increased fuel proliferation and reduced fire suppression over the long term would result in substantially increased probabilities that wildfires would be widespread and high in severity. This would ultimately lead to far larger areas requiring fire rehabilitation and more difficulty restoring these areas than if they had been subjected to planned treatments.

*Noxious and Invasive Weed Management.* Under Alternative D, the removal of cheatgrass without the use of acetolactate synthesis-inhibiting herbicides, which would be prohibited under this alternative, would be less practical and probably less effective.

**Conclusion.** Treatments would not occur at a scale and rate, when combined with the actions proposed for vegetation, fish and wildlife, special status species, wild horses, livestock grazing, and fire management, that would reverse the historic deterioration in rangeland health and restore resiliency of vegetation communities. The long-term consequences would be more dramatic and severe than in other alternatives due to the differences in fire management and other programs.

### Alternative E

**Impacts from Watershed Management Direction.** Under Alternative E, the vegetation treatment areas and watershed restoration program would be very similar to Alternative B.

As with the previous alternatives, treatment success of the Great Basin vegetation types is expected to be highest in the higher elevation areas occupied by pinyon-juniper and mountain sagebrush and lowest in the lower elevation salt desert shrub areas. This again would represent a higher success rate for the smaller watersheds than most larger ones. Under this alternative, the high proportion of treatment related to pinyon-juniper would lead to a potentially higher overall success rate than for Alternative A. As in Alternative B, treatments would be concentrated within specific watersheds until all functions of the watershed are restored.

#### *RMP Management Focus*

*The restoration and maintenance of healthy ecological systems within watersheds is a primary focus for the future management of the Ely District. Healthy ecological systems are geographically diverse and change over time. They are compatible with soil potential and are resilient to disturbance.*

*Resources and resource uses will be managed to restore or maintain ecological health. Certain resource management changes and active treatments may need to be implemented, in portions of watersheds, to accomplish this objective. Adaptive management will be pursued to avoid deteriorating conditions favoring invasive plants and catastrophic fires. Any projects will be implemented so as to result in a mosaic of vegetation within a watershed.*

*In the long term, natural disturbance (such as drought or fire) will occur and fewer treatments will be needed to maintain ecological health. The result will be a variety of vegetation phases within a watershed, which will provide diverse, healthy conditions for future generations.*



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**Impacts from Other Programs.** Impacts on watershed restoration associated with the lands and realty, minerals extraction, and noxious and invasive weed management programs would be the same as described for Alternative A. Impacts associated with fish and wildlife, special status species, vegetation, wild horses, fire management, and special designations management activities would be the same as or similar those described for Alternative B. Impacts associated with livestock grazing would be similar to Alternative C.

**Conclusion.** The restoration approach of Alternative E, when combined with the actions proposed for vegetation, fish and wildlife, special status species, wild horse, livestock grazing, and fire management, addresses all of the watershed health management issues on the District with the scale of treatments needed to reverse the historic deterioration in rangeland health and restore vegetation resiliency.



## 4.20 Fire Management

### Impact Issues

Restoration of natural fire regimes is a primary long-term goal of the Ely Field Office fire management program. Restoration of natural fire regimes is hindered by profound ecological system changes that have altered and continue to affect fuel amounts, types, and distribution. Fuels management, mainly through vegetation modification, is central to the achievement of this goal.

### Assumptions for Analysis

- Natural ignition events would continue to occur in approximately the same distribution and frequency as observed in the past.
- Frequency of human-caused accidental ignitions would increase almost proportionately over time as the level of use increases along roads and railroads and in recreational areas.



### Interactions with Other Programs

The fire management program within the Ely District potentially would be affected by actions within the resource management programs for vegetation, special status species, wild horses, lands and realty, renewable energy, travel management and off-highway vehicle use, recreation, livestock grazing, woodland and native plant products, geology and mineral extraction, watershed management, noxious and invasive weed management, and special designations.

**Goal – Provide an appropriate management response to all wildland fires, with emphasis on firefighter and public safety, consistent with overall management objectives.**

### Alternative A

**Impacts from Fire Management Direction.** The Ely Managed Natural and Prescribed Fire Plan would continue to be implemented (see **Map 2.5-2**). This plan has been in effect for several years and would continue to provide effective guidance for responding to and managing wildfires. This plan would allow fire



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use fires on approximately 3.6 million acres of the District. Other aspects of this alternative, however, constrain the application of prescribed burning and contribute to continued accumulation of woody fuels in untreated and unburned areas, increasing the risk for eventual large scale wildfires that not only cause ecological damage but also jeopardize human safety and property.

### Impacts from Other Programs.

*Vegetation.* As the fuel for wildfires, characteristics of live and dead vegetation dictate fire behavior and intensity. Flash or fine fuels (e.g., dried grasses) are small, quick to burn, and result in more frequent fires. Heavy fuels (e.g., trees and downed logs) are large and typically slower to burn; their accumulation tends to result in more intense fires. As described in the Section 3.1.4, Vegetation, both cheatgrass and woody species are increasing District-wide creating fuel loads higher than previously seen.

Management of vegetation under Alternative A would continue without focus on understory hazards (e.g., removal of cheatgrass). Cheatgrass, when cured, would continue to carry fires when cured over large areas. Reductions in the larger fuel categories (e.g., pinyon and juniper trees), would continue at a low level of activity affecting fire behavior locally where management occurs. Contiguous fuels would continue to exist and proliferate throughout the District due to the small area of active vegetation management being inadequate to diversify the fuel conditions on a watershed or landscape scale.

*Special Status Species.* Managed natural fires within the District would continue to be influenced by constraints to protect and conserve habitat for special status species, especially the greater sage-grouse and other sagebrush obligate species. Standard operating procedures would influence the way wildfire suppression actions could take place within desert tortoise habitat on the District.

*Wild Horses.* Grazing affects fuel conditions and, therefore, fire behavior. Grazing primarily affects the distribution, amount, height, and vigor of herbaceous species, such as perennial grasses, which can determine fire characteristics. Where fine fuels are reduced, fires are less likely to burn without strong winds. Under these conditions, unburned woody fuels continue to accumulate, which is known to contribute to fire intensity. Consequently, although grazing reduces fine fuels, it has a negative overall effect on the ability of management to effectively achieve fire management goals of periodic, less intense fires. Wild horse populations and herd management areas also affect the planning for fire use and the response planning for wildland fires. Wild horse populations also have a major effect on both the planning and success of restoration efforts following fire.

*Lands and Realty.* Land transactions can affect fire management because of ownership changes; however, the current low level of land designated for possible disposal is negligible in relation to the District as a whole. Utility corridors and linear rights-of-way that remove or reduce vegetation, and therefore fuels, can serve as fuel breaks. Linear corridors, including roads, provide access and influence fire management both positively and negatively. Corridors provide public and administrative access to areas whereby the risk of human-caused fire ignition increases in those areas; however, the same access is afforded to fire fighters for suppressing human or natural caused fires. Implementation of the standard operating procedures would



continue to address increased risk with increased readiness. As a result, the effects to fire management would be minor.

*Renewable Energy.* Under Alternative A, no areas would be identified as potential wind energy development areas and applications for alternative energy sources would continue to be reviewed and approved on a location-by-location basis. This policy has minimal effect, either beneficial or adverse, on fire management.

*Travel Management and Off-highway Vehicle Use.* Roads provide access to areas whereby the risk of human-caused fire ignition increases in those areas; however, the same access is afforded to fire fighters for suppressing human or natural caused fires. The District policy of allowing off-road travel, and the resulting proliferation of roads, would continue to result in both potential ignition sources as well as access for fire fighters.

*Recreation.* Recreational activities that occur on the District inherently increase the risk of human caused fire due to the common outdoor use of lighters, campfires, vehicles, and cook stoves. The risk of recreation-related ignitions would be highest around human concentration areas such as District campgrounds.

*Livestock Grazing.* The impacts to fire management associated with livestock grazing management activities would be the same as described for wild horses, except that livestock grazing is easier to manage on restored areas following fire.

*Woodland and Native Plant Products.* Woodland and native plant product harvesting affects fuels both positively and negatively. Of the permitted activities, green tree harvesting for fuelwood or posts and poles would reduce and redistribute the greatest amounts of fuel. This break-up of fuel continuity would have a desirable effect for fire management. Tree harvesting, however, generates woody debris (slash). Slash left on the ground increases fire hazards in the short term, depending on the slash treatment method. Collection of dead and down wood for fuelwood would reduce the hazard level for medium to large size woody materials on a very localized basis.

*Mineral Extraction.* The effects of mineral extraction activities on fire management would be similar to those discussed for lands and realty and travel and off-highway vehicle use. Standard operating procedures would continue to address increased risk of fire with increased readiness for suppression.

*Watershed Management.* Vegetation treatments would be limited in size and not concentrated within specific watersheds. This approach is not expected to affect implementation of the existing fire management plan.

*Noxious and Invasive Weed Management.* Noxious and invasive weeds would continue to affect fire behavior and frequency. As noxious and invasive plants dominate plant communities, fuels increase locally. Cheatgrass is highly flammable when cured and generates fires that burn frequently and rapidly. The resulting fire behavior dictates appropriate management and fire fighter capabilities.



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The treatment or removal of noxious and invasive weeds on the District would affect fuels available for fire; however, this change is highly localized and operates on a spatial and temporal scale different than fire. Noxious weed treatment under Alternative A would be concentrated along roads, which are useful as fuelbreaks during suppression activities. Treating roadside weeds would consequently help maintain existing roadways as fuel breaks and decrease the spread of weeds into new undisturbed areas.

*Special Designations.* Standard operating procedures would continue to require wilderness classifications to be considered during development of appropriate fire management response.

**Conclusion.** Continued implementation of the existing Ely Managed Natural and Prescribed Fire Plan would allow case-by-case decisions based in part on where the fire occurs in relation to where in the District such fire would be considered beneficial or detrimental. This approach allows widespread use of managed beneficial wildfires (fire use) across the entire District, but limits the application of prescribed burning.

### Alternative B

**Impacts from Fire Management Direction.** Impacts to fire management associated with program-specific management activities would be similar to Alternative A, except the fire plan would be refined, as needed, through, first, incorporation of the revised Fire Management Plan (BLM 2004a), and secondly, through the watershed analysis process. Fire would be used to the greatest extent practicable for implementing the desired vegetation treatments, resulting in common and widespread fires within areas identified for vegetation treatment. Restoration of vegetation resilience and return to historical fire regimes and condition classes would reduce the need for major rehabilitation efforts following the occurrence of fire.

The revised Fire Management Plan includes detailed fire planning information for each of the 25 Fire Management Units shown on **Map 2.5-3**. This detailed planning approach facilitates prompt fire management response for wildland fires by providing specific guidance and direction for each unit based on resource values, fuel characteristics, physical characteristics, health and safety risks, fire management unit objectives, operational constraints, and rehabilitation strategies. This detailed planning approach facilitates the application of managed wildfires in meeting the vegetation treatment objectives throughout the District.

**Impacts from Other Programs.** Impacts to fire management associated with fish and wildlife, mineral extraction, and noxious and invasive weed management activities would be the same as or similar to those described for Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Vegetation.* Under Alternative B, active restoration, including fuel reductions, would be increased substantially from current levels. Much of this restoration effort would be accomplished through the use of prescribed fire and managed natural fire, as well as the use of mechanical and chemical treatments. Thus, the vegetation program would provide the basis for a substantially increased effort in fire management, particularly in relation to fire use and prescribed burns.



*Wild Horses.* Under Alternative B the elimination of several herd management areas with marginal to inadequate habitat to sustain wild horse population would result in greater accumulation of herbaceous plant materials in these areas. This could potentially contribute to increased fire risk but also would aid in establishment of a more natural fire regime.

*Lands and Realty.* Under Alternative B, an increased area would be designated for possible disposal primarily for community development. Commonly, development can lead to increased ignition sources from human activities and therefore potentially increased fire risk on adjacent public lands.

*Renewable Energy.* This policy of encouraging wind energy development would likely lead to increased development of access corridors to such areas which may affect fire management in the same manner as roads and corridors discussed under Lands and Realty.

*Travel Management and Off-highway Vehicle Use.* Open areas for off-highway vehicle use would be eliminated under Alternative B, thereby reducing the risk of ignition sources in remote areas of the District.

*Recreation.* Alternative B includes designation of nine special recreation management areas totaling approximately 2,680,000 acres. This decision, coupled with the changes in off-highway vehicle use policies discussed above, would tend to reduce the risk of human-caused fires in remote areas of the District while increasing the risk in these designated areas.

*Livestock Grazing.* Under Alternative B, livestock grazing would be eliminated from approximately 3.5 million acres. The resultant additional vegetation growth and accumulation in these areas could increase the fire risk, but aid in the establishment of a more natural fire regime.

*Woodland Products.* Fuelwood activities would be confined to designated areas under Alternative B, which would potentially reduce the number of dispersed ignition sources on the District.

*Watershed Management.* The greater area of watershed treatment under this alternative would emphasize substantially greater application of fire use fires and prescribed fires than in Alternative A.

*Special Designations.* Impacts to fire management associated with special designations would be similar to Alternative A. Designation of 18 new ACECs may affect decisions regarding fire management in or near these areas.

**Conclusion.** Implementation of this alternative would result in a major increase in the use of fire after watershed resilience is improved throughout the watersheds in the District. Fire use and prescribed fire would be implemented year-round to meet resource objectives in accordance with the revised Ely Fire Management Plan (BLM 2004a). An increase in mechanical, biological, and herbicide use may be necessary to meet management goals prior to expanding the use of fire.



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### Alternative C

**Impacts from Fire Management Direction.** Fire management would focus on full suppression throughout the District. This approach is expected to result in continued accumulation of heavy fuel supplies in untreated sagebrush and woodland communities until natural ignition occurs in these areas. At that point, suppression and control of the resulting fires may be difficult, if not impossible. Thus, over the long term, this approach would lead to increased risk of eventual large scale wildfires that would cause ecological damage and jeopardize human safety and property.

**Impacts from Other Programs.** Impacts to fire management associated with livestock grazing, woodland and native plant products, mineral extraction, and noxious and invasive weed management activities would be the same as or similar to Alternative A. Impacts associated with special status species, vegetation, wild horses, lands and realty, watershed management, and special designations management activities would be the same as or similar to Alternative B. The following interrelated program would result in different impacts.

*Travel Management and Off-highway Vehicle Use.* Approximately 32,000 acres are designated as open to cross-country off-highway vehicle use under Alternative C. These areas are all within dry lake beds and should pose minimal threat for fire ignitions.

*Recreation.* Alternative C includes designation of nine special recreation management areas totaling approximately 3.3 million acres. These areas, like the off-highway vehicle emphasis areas, involve an increased risk of human-caused fire ignitions, but the increased risk in these concentrated use areas tends to be offset by the reduction in risk in remote areas of the District closed to such activities. Alternative C includes designation of approximately 734,000 acres for off-highway vehicle emphasis areas, carrying with it associated risks for human-caused fire ignitions. This is a substantially larger area designated for such use than in Alternative B.

**Conclusion.** Full suppression of fires within the District would be practical only on a short-term basis. Over the long term, the attempts at full suppression would probably lead to catastrophic widespread fires resulting in long-term ecological damage and increased risk to human safety and property.

### Alternative D

**Impacts from Fire Management Direction.** Alternative D would emphasize minimal suppression of wildland fires except for human-caused and those that threaten life or property. This approach would result in increased average size of fires and greater areas being rehabilitated on an annual basis. The relative absence of vegetation treatments in sagebrush and woodland communities and the absence of grazing would lead to continued accumulation of both heavy and fine fuels followed by eventual large-scale fire events that would have a high risk of causing ecological damage and jeopardizing human safety and property.



**Impacts from Other Programs.** Impacts to fire management associated with special status species, woodland and native plant products, and watershed management activities would be the same as or similar to Alternative A. The following interrelated programs would result in different impacts.

*Vegetation.* Under Alternative D, active restoration would occur at low levels, and the untreated vegetation communities would continue to accumulate live and dead fuels. Pinyon-juniper woodlands, in particular, would continue to accumulate woody fuels that would contribute to increased fire hazards.

*Wild Horses.* The uncontrolled expansion of wild horse populations within herd management areas would result in minimal vegetation, and reduced fire risk, in these areas.

*Lands and Realty.* There would be no net loss of public land under Alternative D, nor would there be any new land use authorizations such as the designation of new rights-of-way. This would serve to reduce ignition sources from human activity.

*Renewable Energy.* Renewable energy development would be severely curtailed due to the elimination of new land use authorizations. This would have a similar impact as that for Lands and Realty under this alternative.

*Travel Management and Off-highway Vehicle Use.* Alternative D would restrict off-highway vehicle use to existing designated roads and trails throughout the District and there would be no off-road open areas. Roads and trails not mechanically maintained would be rehabilitated. This approach would substantially reduce the risks associated with human-caused fire ignitions throughout much of the District.

*Recreation.* Under this alternative, there would be no Special Recreation Permits issued including outfitter and guide permits, motorcycle race events, and truck race events. As with the off-highway vehicle policy above, this would reduce the risk of human-caused fire ignitions.

*Livestock Grazing.* Under Alternative D, livestock grazing in the District would cease, thereby eliminating some human activity and vehicular travel throughout the area and reducing the risk of human-caused fire ignitions. The elimination of grazing also would encourage the growth and accumulation of fine fuels in those vegetation communities where an herbaceous understory is present. These changes would promote a greater fire risk and contribute to widespread fires under this alternative.

*Minerals Extraction.* Alternative D would involve substantial reduction in the areas available for mineral development, especially development involving minerals leasing and sales. This reduction in area available, may or may not affect the actual level of exploration and development activity, but would constrain where it could occur. As with the constraints on other human activities discussed above, this could reduce the risk of human-caused fire ignitions in those areas closed to development.

*Noxious and Invasive Weed Management.* Alternative D would prohibit the use of selected categories of herbicides. This restriction would seriously hamper efforts to control some invasive weeds in numerous settings where they provide a fine fuel supply and contribute to fire susceptibility.



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**Conclusion.** Buildup of fuels would occur throughout the District and eventually lead to catastrophic fires, resulting in long-term ecological damage and increased risk to human safety and property. It is expected that such fires would occur earlier in time with this alternative than with Alternative C.

### Alternative E

**Impacts from Fire Management Direction.** Implementation of this alternative would result in a major increase in the use of fire after watershed resilience is improved throughout the watersheds in the District. Fire use and prescribed fire would be implemented year-round to meet resource objectives in accordance with the revised Ely Fire Management Plan (BLM 2004a). An increase in herbicide use also may be necessary to meet management goals prior to expanding the use of fire.

**Impacts from Other Programs.** Impacts to fire management associated with special status species, livestock grazing, mineral extraction, watershed management, and noxious and invasive weed management activities would be the same as or similar to Alternative A. Impacts associated with vegetation, wild horses, lands and realty, renewable energy, travel management and off-highway vehicle use, recreation, woodland and native plant products, and special designations management activities would be similar to Alternative B, although differing in degree or scale.

**Conclusion.** Implementation of this alternative would result in a major increase in the use of fire after watershed resilience is improved throughout the watersheds in the District. Fire use and prescribed fire would be implemented year-round to meet resource objectives in accordance with the revised Ely Fire Management Plan (BLM 2004a). An increase in herbicide use also may be necessary to meet management goals prior to expanding the use of fire.

#### *RMP Management Focus*

*The restoration and maintenance of healthy ecological systems within watersheds is a primary focus for the future management of the Ely District. Healthy ecological systems are geographically diverse and change over time. They are compatible with soil potential and are resilient to disturbance.*

*Resources and resource uses will be managed to restore or maintain ecological health. Certain resource management changes and active treatments may need to be implemented, in portions of watersheds, to accomplish this objective. Adaptive management will be pursued to avoid deteriorating conditions favoring invasive plants and catastrophic fires. Any projects will be implemented so as to result in a mosaic of vegetation within a watershed.*

*In the long term, natural disturbance (such as drought or fire) will occur and fewer treatments will be needed to maintain ecological health. The result will be a variety of vegetation phases within a watershed, which will provide diverse, healthy conditions for future generations.*



## 4.21 Noxious and Invasive Weed Management

### 4.21.1 Noxious Weeds

#### Impact Issues

Noxious and invasive weed introduction and spread generally are functions of vectors (e.g., animals, wind, and vehicles) that transport plant material to and within the District and of ground disturbances that promote their establishment. The establishment and spread of noxious and invasive weeds results in the disruption of natural ecological systems. The control of noxious and invasive weeds is dependant on the identification and implementation of appropriate monitoring and treatment methods.

Please refer to Section 4.5, Vegetation, for general impacts from vegetation tools and techniques. Tools and techniques that may affect the potential invasion, establishment, expansion, and control of noxious and invasive weeds include fire, mechanical and chemical treatments, grazing management, and biological agents.

#### Assumptions for Analysis

- Noxious weed management would continue to operate in concert with, but independent of, watershed restoration priorities because the management response to weeds must be considerably more rapid than a 10- to 15-year strategic schedule based on multiple resource values.

#### Interactions with Other Programs

The noxious weeds management program within the Ely District potentially would be affected by actions within the resource management programs for vegetation, fish and wildlife, wild horses, lands and realty, renewable energy, travel management and off-highway vehicle use, recreation, livestock grazing, woodland and native plant products, geology and mineral extraction, fire management, and special designations.

**Goal – Prevent the introduction and spread of noxious and invasive weeds. Control or eradicate existing populations.**

#### Alternative A

**Impacts from Noxious and Invasive Weed Management Direction.** The majority of the existing standard operating procedures address noxious weed prevention for all activities on the District, although some are focused on program-specific activities. Prevention emphasis currently is placed on reducing weed vectors (e.g., vehicles and equipment) and on post-disturbance monitoring and revegetation. All seed mixes, mulches, topsoil, and hay used in revegetation projects on the Ely District are required to be weed-free. Although it is impossible to prevent all noxious and invasive weed species from entering and spreading on the District, these measures are expected to continue to substantially reduce weed vectors.



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Maintenance or, if necessary, re-establishment of desired vegetation in resilient plant communities is the primary means of preventing weed establishment following disturbance. Revegetation currently is conducted with native and nonnative species following ground disturbing activities in all areas of the District except designated wilderness and Wilderness Study Areas, where nonnatives are not used. Most efforts for revegetation involve seeding. Success rate, in part, is a function of monitoring revegetation efforts to determine the need for re-treatment.

Treatment methods for noxious and invasive weed control include chemical, mechanical, cultural, or biological. Existing standard operating procedures and tools and techniques address District-wide use of herbicides, livestock (e.g., sheep, goats), and biological organisms (e.g., insects, pathogens) to manage weed infestations. Under Alternative A, emphasis would continue to be placed on treating weed infestations associated with roads where weed introduction, establishment risks, and existing problems are highest. Isolated weed occurrences would continue to have the potential to spread unchecked.

### **Impacts from Other Programs.**

*Vegetation.* Vegetation treatments can introduce or proliferate weeds as a function of ground disturbances. An average of 10,000 acres per year typically would be treated. Any of these areas with ground disturbance or new roads would be highly vulnerable to weed establishment.

Revegetation would minimize the potential establishment and spread of noxious and invasive weeds by stabilizing soils and establishing groundcover; however, seeding also could be a vector for weed introduction. Weed-free seed and straw mulch, where used, would be required for revegetation efforts, precluding this threat to the extent that such seed and straw are available and used. Implementation of the other standard operating procedures listed under Noxious and Invasive Weed Management in Appendix H would minimize potential for introduction and spread of these species.

*Fish and Wildlife.* Existing management direction for weed treatments provides for case-by-case review of protections needed for wildlife and special status plants. Treatments are prohibited within 0.25 mile of active sage grouse leks during the strutting season, 0.25 mile of known nesting or brood rearing areas, or 0.5 mile of nesting areas for sensitive species during the nesting season. Treatment buffers are required up to 100 feet from riparian habitats and water sources when using herbicides that are not approved for use near water. These and other restrictions regarding the use of sheep or goats within historic bighorn sheep range pose some limitations on weed treatment methods within portions of the District.

*Wild Horses.* The general consequences of wild horses in relation to noxious weed management would be the same as identified for livestock grazing, except that wild horses would not transport weeds from distant places as often as cattle and sheep that may be trucked from one area to another.

*Lands and Realty.* Utility corridors and linear rights-of-way provide areas for weeds to establish and spread. Right-of-way management and other permitted lands actions would continue to be conducted in compliance with the required standard operating procedures. Existing standard operating procedures address noxious weed prevention related to equipment use, ground disturbance, and reclamation at the



close of permitted activities. Standard operating procedures that apply to right-of-way permit holders and others under contract require vehicle wash downs, pre-disturbance surveys, and mitigation, as needed. The implementation of standard operating procedures would minimize potential effects associated with the administration of rights-of-way and corridors.

Depending on planned use, possible land disposals that may occur have the potential to increase noxious and invasive weeds subsequent to change in ownership. For example, if disposed parcels were developed subsequent to leaving public domain and the disposed parcel is adjacent to other public land, the risk of noxious weed establishment and spread may increase on the District, depending on the type of development involved.

*Renewable Energy.* Effects would be similar to lands and realty for areas disturbed in conjunction with renewable energy developments and associated corridors.

*Travel and Off-highway Vehicle Use.* Road construction, use, abandonment, and maintenance activities all have the potential to transport and proliferate noxious and invasive weeds. Roads are continually disturbed ground surfaces with enhanced water runoff on the adjacent roadsides, both conditions that favor the establishment of weeds. Personal vehicles that use the roads in the District can introduce plant materials from elsewhere, thereby increasing the distribution of noxious and invasive weeds and introduction of new weed species.

The majority of the District would continue to be open for off-highway travel. As a result, the potential for introduction and spread of noxious and invasive weeds beyond existing roads and into unroaded areas would continue. This could be partially minimized through the consideration of off-road closures in weed-infested areas and closure of 760,000 acres to off-highway vehicle use.

*Recreation.* All developed and dispersed recreational facilities are vulnerable to the introduction and spread of noxious and invasive weeds because of public access via vehicle, the use of pack animals, and the concentration of impacts on the ground. Potential impacts associated with outfitters, guides, and recreationists using horses, llamas, or other stock would be minimized to an extent as only certified weed-free hay would be allowed to be brought onto public lands.

*Livestock Grazing.* Livestock grazing is managed to achieve or maintain appropriate rangeland health standards. Typically, rangelands that are in good ecological health are less vulnerable to weed establishment than poor or degraded conditions. Livestock moving from infested areas on private lands to public land allotments can be a major vector for weed seeds.

On all actively grazed allotments, regardless of animal class or numbers, there are animal concentration areas that receive the greatest impacts. Heavily impacted and newly disturbed areas associated with waters, salts, traps, fence lines, range improvements and sheep bedding grounds would remain highly vulnerable to weed establishment. In addition, livestock can transport noxious and invasive weed propagules (e.g., seed and plant parts) into these areas. These hazards and risks would continue at levels dictated by the implementation of standard operating procedures such as monitoring high-risk areas.



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Livestock can adversely affect revegetation efforts that are essential to preventing weeds from establishing on recently disturbed areas through trampling and grazing of young plants. For this reason, livestock typically would be excluded from seeded areas for 2 to 3 years.

*Woodland and Native Plant Products.* Public and commercial fuelwood, post and pole, pinyon pine nut harvest, and Christmas tree cutting activities would be allowed throughout the Ely District with few exceptions. Combined with the largely open transportation policy on the District, off-road travel and the ultimate establishment of two-track trails that become roads could be associated with the woodland and native plant products program. Due to the broad area open to these public activities, any resulting establishment or spread of noxious or invasive weeds could become widely dispersed.

*Mineral Extraction.* Under Alternative A, approximately 1.1 million acres would be closed to mineral extraction leaving the majority of the Ely District open. Based on the best available information, it is anticipated that 14,800 acres of the Ely District that would be developed for minerals. Road construction, use, abandonment, and maintenance related to mineral development all provide the potential for transport and proliferate weeds. Mineral operations would be conducted in compliance with standard operating procedures, thereby minimizing weed-related impacts. These standard operating procedures address noxious weed prevention related to equipment use, ground disturbance, and reclamation at the close of exploration, construction, and operation of permitted activities.

The level of risk associated with minerals development is roughly proportional to the level of development. Under this alternative, the current low levels of mineral development would continue to pose moderate to low levels of risk for the introduction and spread of noxious and invasive weeds depending on compliance with leases, permits, and the standard operating procedures contained in them. The greatest risks would be associated with new road construction that penetrates into currently unroaded areas.

*Fire Management.* Existing standard operating procedures would continue to require that fire suppression equipment from off-District to be washed prior to entering and upon exiting the Ely District. Emergency stabilization and rehabilitation practices that follow wildfire incidents on the District would include immediate seeding to rapidly re-establish a vegetation cover and prevent soil loss. Existing standard operating procedures regarding the use of native seed, weed-free seed, and weed-free mulch would continue to be implemented. These prevention measures would help minimize weed-related impacts.

Of greatest concern is the relationship between the nonnative, invasive, cheatgrass and fire. Cheatgrass and other annual bromes of Mediterranean origin are adapted to fire and proliferate to become a monocultural cover wherever bare ground allows. Management of fire under this alternative would take cheatgrass abundance into account (based on available information), whenever practical; however, cheatgrass would continue to spread following fires.

*Special Designations.* Actions to nominate and designate special management areas do not directly affect noxious weed management; however, management plans for these areas which attract recreation or exclude mineral entry can have positive or negative weed-related effects. No new special designations would be made to prevent spread of noxious or invasive weeds.



*Health and Safety.* Health and safety precautions would continue to be implemented through standard operating procedures, primarily during weed treatment with herbicide. These precautions would not conflict with the treatment of noxious and invasive weeds on the District.

**Conclusion.** Weed control efforts historically have focused primarily on toxic and noxious weed species with less attention devoted toward the spread of annual invasive species such as cheatgrass, which provide usable forage during a short grazing season each spring. Current management includes emphasis on slowing and reversing the spread of these invasive species through application of integrated pest management methods. Under this alternative, the rate of spread of noxious and invasive weeds would increase in both the short and long term.

### **Alternative B**

**Impacts from Noxious and Invasive Weed Management Direction.** Noxious and invasive weed impacts associated with program-specific management activities would be the same as described for Alternative A.

**Impacts from Other Programs.** Noxious and invasive weed impacts associated with renewable energy, recreation, mineral extraction, woodland and native plant products, and health and safety management activities would be the same as or similar to Alternative A. The following interrelated programs would result in different impacts compared to Alternative A.

*Vegetation.* Under Alternative B, there would be a potential for a substantial increase in ground disturbing activities from current levels in associated with vegetation treatments. This would correspondingly increase the risk of weed spread on the District over current levels in association with vegetation treatments. Priorities for active management of vegetation would include an array of vegetation communities identified in Section 2.5.5 where existing conditions do not meet the desired range of conditions. Disturbance of existing vegetation to implement treatments carries with it the risk for additional weed spread if the treatment is not successful.

*Fish and Wildlife.* The elimination of livestock grazing in all Rocky Mountain bighorn sheep ranges and migration routes would minimize the potential for invasion, establishment, and expansion of noxious and invasive weed species in these areas. Intensive localized grazing over the long term reduces native vegetation cover and increases the potential for weedy species establishment. Weed seeds also can be transported by livestock (e.g., seeds attached to wool) from one grazing area to another.

*Wild Horses.* Alternative B would result in elimination of several herd management areas that do not provide suitable or adequate habitat to sustain wild horse populations. This action would contribute to restoration and reduction in weed risks in these areas.

*Lands and Realty.* Noxious and invasive weed impacts associated with lands and realty management activities would be the same as described for Alternative A except that the total area available for possible disposal would be about three times as large.



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*Travel Management and Off-highway Vehicle Use.* Under Alternative B, the areas open to off-highway vehicle use would be substantially reduced to approximately 310,000 acres designated as off-highway vehicle emphasis areas. This would result in lower risks for weed dispersal through this vector.

*Livestock Grazing.* This alternative includes elimination of livestock grazing from the remainder of the Mojave Desert and desert bighorn and Rocky Mountain bighorn sheep ranges and migration routes, thus contributing to the vegetation restoration and reduction in the weed risks in these areas.

*Fire Management.* The increased use of fire as a vegetation management tool would increase the probability for noxious and invasive species expansion and establishment in burned areas if revegetation efforts fail and weed control measures prove ineffective in the short and long term. However, if native vegetation becomes reestablished in burned areas, the resiliency of vegetation to future fires would minimize the likelihood of expansion and establishment of noxious and invasive weed species within new areas.

*Woodland and Native Plant Products.* Alternative B would restrict public fuelwood activities to designated areas. This would concentrate and localize disturbances rather than dispersing them across wide areas. The designation of fuelwood areas would provide substantially greater opportunities for monitoring weeds and treating them early when compared to Alternative A.

*Special Designations.* Impacts associated with special designations would be similar to Alternative A except that 18 new ACECs totaling approximately 141,400 acres would be designated.

**Conclusion.** Alternative B would be similar to Alternative A in terms of weed management, but the substantial increase in vegetation treatments under this alternative would temporarily increase the risk of weed invasion and expansion in areas disturbed by treatment but reduce the vulnerability of these same areas on a long-term basis. Therefore, this alternative would reduce the rate of spread of noxious and invasive weeds on a long-term basis.

### Alternative C

**Impacts from Noxious and Invasive Weed Management Direction.** Noxious and invasive weed impacts associated with program-specific management activities would be the same as described for Alternative A.

**Impacts from Other Programs.** Noxious and invasive weed impacts associated with fish and wildlife, renewable energy, recreation, mineral extraction, and health and safety management activities would be the same as or similar to Alternative A. Impacts associated with vegetation, wild horses, livestock grazing, and special designations would be the same as or similar to Alternative B. The following interrelated programs would result in different impacts compared to Alternatives A and B.

*Lands and Realty.* Noxious and invasive weed impacts associated with lands and realty management activities would be the same as described for Alternative B except that a total area available for possible disposal would be about three times as large or approximately ten times that of Alternative A.



*Travel and Off-highway Vehicle Use.* Noxious and invasive weed impacts associated with travel and off-highway vehicle management activities would be similar to those described for Alternative B except that approximately 734,000 acres would be designated as off-highway vehicle emphasis areas.

*Fire Management.* The full suppression approach to fire management would likely result in short-term reduction of fire events followed by increased number of large-scale events over a longer period. The large-scale, intense fire events create burned areas that are typically more difficult to successfully revegetate, thus increasing the risk for establishment and spread of invasive and noxious weed species.

**Conclusion.** The level of vegetation treatments involved in Alternative C would be approximately the same as Alternative B. This alternative, like Alternative B, would reduce the long-term impacts of noxious and invasive weeds through vegetation treatments, but this would likely be offset by the increased probability of weed establishment and spread following major wildfire events.

### **Alternative D**

**Impacts from Noxious and Invasive Weed Management Direction.** Without the use of selected herbicides, such as the sulfonylurea group and other acetolactate synthase inhibitors, as proposed under Alternative D, it is anticipated that there would be an increase in invasive-dominated areas in the District due to the lack of an effective control method. For example, the sulfonylurea herbicides are highly effective tools for the reduction of hoary cress, tall whitetop, and Russian knapweed.

**Impacts from Other Programs.** Noxious and invasive weed impacts as a result of fish and wildlife, wild horses, renewable energy, woodland and native plant products, special designations, and health and safety management activities would be similar to those described for Alternative A. Impacts associated with fire management activities would be similar to those described for Alternative C.

*Vegetation.* Weed treatment after fire use would minimize the potential for invasion and spread of noxious and invasive species within burned areas in the short term. After several years of weed treatment and revegetation, perennial plant cover would be adequately established, which would minimize invasion by noxious and invasive species.

*Lands and Realty.* This alternative would result in the no net loss of public lands, thus requiring that acquisitions be made to offset the currently mandated possible disposal under the Lincoln County Land Act. As a result, potential weed spread resulting from construction activities on nearby private lands (i.e., lands recently disposed for residential and commercial development) would be reduced relative to the other alternatives.

*Travel Management and Off-highway Vehicle Use.* This alternative would effectively close the District to off-highway vehicle use except on existing designated roads and trails, a substantially lower level of authorized use than in the other alternatives. This would reduce the likelihood of weed spread through use of such vehicles.



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*Recreation.* Allowable recreation uses under Alternative D would not include any off-road vehicle races, thereby reducing the likelihood of weed spread through such events and the associated traffic.

*Livestock Grazing.* No livestock grazing would be permitted, thus removing livestock use not only as a weed vector, but also as a useful management tool in selected settings to control particular weed species or to help incorporate seeds into the soils of areas being rehabilitated.

*Minerals Extraction.* Most mineral sales and leases would be eliminated under this alternative, reducing the potential for weed spread associated with development activities and additional access road construction.

*Fire Management.* Fire management would include minimal fire suppression. This, coupled with the lack of livestock grazing is expected to lead to expansion of invasive species.

**Conclusion.** Weed management would involve exclusion of some groups of herbicides. This would effectively reduce the capability to control several weed species and increase impacts associated with noxious and invasive weeds. The combination of weed management actions with other program actions under this alternative would not reduce the rate of spread of noxious and invasive weeds in the long term.

### Alternative E

**Impacts from Noxious and Invasive Weed Management Direction.** Program-specific actions and associated impacts under Alternative E would be the same as described for the Alternative A.

**Impacts from Other Programs.** Noxious and invasive weed impacts associated with fish and wildlife, renewable energy, recreation, watersheds, and health and safety management activities would be the same as or similar to Alternative A. Impacts associated with vegetation, wild horses, lands and realty, travel and off-highway vehicle use, mineral extraction, woodland and native plant products, special designations, and fire management activities would be the same as or similar to those described for Alternative B.

*Livestock Grazing.* No domestic sheep or goat grazing would be allowed within 9 miles of desert bighorn sheep habitat except where natural or man-made barriers effectively prevent physical contact. This approach would eliminate the use of domestic sheep or goats for weed control and eradication in such areas and may necessitate greater use of herbicides for such purposes.

**Conclusion.** Alternative E involves a combination of weed management similar to Alternative A plus vegetation treatments at a substantially greater scale than Alternative A to restore vegetation resilience. On a long-term basis, this is expected to result in a substantial reduction in the risk of establishment and spread of noxious and invasive species.



## 4.22 Special Designations

### Impact Issues

The primary impact issue associated with special designation areas is how various resource programs are managed as ACECs under each alternative. These areas are designated based on relevance and importance (see Appendix Q) and are resources that require special management to preserve their values. ACECs vary by alternative based on the effect of management actions on the sensitive resources under each alternative.

### Assumptions for Analysis

None.

### Interactions with Other Programs

The special designations management program of the Ely District is not affected by actions of the other resource management programs.

**Goal – Evaluate areas of interest for special designation and appropriately manage those areas that meet necessary requirements.**

### Management Common to All Alternatives

**Table 2.5-22** summarizes how the resources that met relevance and importance criteria within areas nominated as ACECs are protected by the actions within the alternatives.

### Alternative A

**Impacts from Special Designations Management Direction.** Under Alternative A, the existing special designation areas identified in Section 2.5.22 and three existing ACECs would be retained. No new special designation areas would be designated under this alternative. Management of these areas would continue to focus on resource protection.

Under Alternative A, 17 existing special designation areas totaling 12,705 acres would be segregated from potential land disposal and general mining laws. However, these lands would not be exempt from possible disposal under the Recreation and Public Purposes Act or the mineral leasing and material sales laws. Additionally, three special designation areas totaling 2,490 acres would be segregated from possible disposal under public land laws, which would not include the general mining laws, the Act of June 14, 1926, commonly known as the Recreation and Public Purposes Act or the mineral leasing and material sales laws (see Section 2.5.22).



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**Impacts from Other Programs.** Other resource programs typically do not affect special designations. Special designation areas typically are used to protect an area from land use planning decisions in other programs. For this reason, no impacts associated with other program management activities have been identified.

**Conclusion.** Approximately 212,500 acres would retain their designation as three ACECs.

### **Alternative B**

**Impacts from Special Designations Management Direction.** Under Alternative B, three of the existing special designation areas totaling 1,810 acres would be retained, 8 areas would be eliminated, and 12 would be redesignated as 11 ACECs (combining Mount Grafton and North Creek) (see Section 2.5.22). In addition, seven new areas also would be designated as ACECs and the three existing ACECs would be retained. The proposed ACECs were determined to meet the relevance and importance criteria and would require special management in order to protect the resource values. (Detailed discussions on the proposed ACECs are presented in Appendix Q.) Implementation of the special management criteria within the newly designated ACECs would result in additional resource protection on approximately 141,400 acres of public land within the District.

Under Alternative B, 12 special designation areas totaling 11,630 acres would be segregated from possible land disposal and general mining laws. However, these lands would not be exempt from possible disposal under the Act of June 14, 1926, commonly known as the Recreation and Public Purposes Act or the mineral leasing and material sales laws. Additionally, the Gamet Hill rockhounding area would be segregated from possible disposal under public land laws, which would not include the general mining laws, the Act of June 14, 1926, commonly known as the Recreation and Public Purposes Act or the mineral leasing and material sales laws (see Section 2.5.22).

One additional Back Country Byway, the Silver State Trail, would be designated.

**Impacts from Other Programs.** Other resource programs typically do not affect special designations. Special designation areas typically are used to protect an area from land use planning decisions in other programs. For this reason no impacts associated with other program management activities have been identified.

**Conclusion.** Approximately 353,900 acres would be designated as three existing and 18 new ACECs.

### **Alternative C**

**Impacts from Special Designations Management Direction.** Under Alternative C, two of the existing special designations totaling 600 acres would be retained, 7 areas totaling 1,995 acres would be eliminated, and 14 would be redesignated as 12 ACECs (combining Mount Grafton and North Creek) (see Section 2.5.22). In addition, seven new areas would be designated as ACECs and the three existing ACECs would be retained. The proposed ACECs were determined to meet the relevance and importance criteria



and would require special management in order to protect the resource values. Detailed discussions on the proposed ACECs are presented in Appendix Q. Implementation of the special management criteria within the newly designated ACECs would result in additional resource protection on approximately 135,900 acres within the District.

Under Alternative C, 12 special designation areas totaling 11,630 acres would be segregated from possible land disposal and general mining laws. However, these lands would not be exempt from potential disposal under the Act of June 14, 1926, commonly known as the Recreation and Public Purposes Act or the mineral leasing and material sales laws. Additionally the Garnet Hill rockhounding area would be segregated from possible disposal under public land laws which would not include the general mining laws, the Act of June 14, 1926, commonly known as the Recreation and Public Purposes Act or the mineral leasing and material sales laws (see Section 2.5.22).

Two additional Back Country Byways, the Silver State Trail and Rainbow Canyon, would be designated.

**Impacts from Other Programs.** Other resource programs typically do not affect special designations. Special designation areas typically are used to protect an area from land use planning decisions in other programs. For this reason, no impacts associated with other program management activities have been identified.

**Conclusion.** Approximately 348,400 acres would be designated as three existing and 20 new ACECs.

#### **Alternative D**

**Impacts from Special Designations Management Direction.** Under Alternative D, all special designation areas would be eliminated. No additional Back Country Byways would be designated

**Impacts from Other Programs.** Since this alternative involves minimal activities in other programs, no special designations are considered necessary, and no impacts associated with other program management activities have been identified.

**Conclusion.** All special designations would be eliminated, but with minimal activity in other management programs, no impacts to the sensitive resources are anticipated from other uses.

#### **Alternative E**

**Impacts from Special Designations Management Direction.** Under Alternative E, three of the existing special designations totaling 1,810 acres would be retained, eight areas totaling 2,155 acres would be eliminated, and 12 would be redesignated as 11 ACECs (combining Mount Grafton and North Creek) (see Section 2.5.22). In addition, seven new areas would be designated as ACECs and the three existing ACECs would be retained. The proposed ACECs were determined to meet the relevance and importance criteria and would require special management in order to protect the resource values. Detailed discussions on the proposed ACECs are presented in Appendix Q. Implementation of the special management criteria within



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the newly designated ACECs would result in additional resource protection on approximately 135,900 acres within the District.

Under Alternative E, 12 special designation areas totaling 11,630 acres would be segregated from possible land disposal and general mining laws. However, these lands would not be exempt from potential disposal under the Act of June 14, 1926, commonly known as the Recreation and Public Purposes Act or the mineral leasing and material sales laws. Additionally the Garnet Hill rockhounding area would be segregated from disposal under public land laws which would not include the general mining laws, the Act of June 14, 1926, commonly known as the Recreation and Public Purposes Act or the mineral leasing and material sales laws (see Section 2.5.22).

Two additional Back Country Byways, the Silver State Trail and Rainbow Canyon, would be designated.

**Impacts from Other Programs.** Other resource programs typically do not affect special designations. Special designation areas typically are used to protect an area from land use planning decisions in other programs. For this reason, no impacts associated with other program management activities have been identified.

**Conclusion.** Approximately 347,900 acres would be designated as three existing and 18 new ACECs.



## 4.23 Economic Conditions

### Impact Issues

The primary economic and social issue is the relationship between the management of public lands and the support provided for local economic and community development.

Issues of specific economic and social concern to individuals, governments, and groups include the potential impacts of grazing on farm income and local economies, the impacts of future management on the economic stimulus derived from recreation and tourism, and access to public lands for various purposes. Local governments are concerned about land and realty actions that result in net losses in the amounts of private land in the region, and along with Tribal governments, programs that unduly limit possible land disposal viewed as essential for future economic and community development. Local governments also are concerned about potential fiscal impacts of changes in ownership on local tax receipts or payments in lieu of taxes and impacts on population that also affect the latter. Concerns over the impacts of wildland fires on residents, property and local fire suppression capabilities and associated budgets also are evident.

### Assumptions for Analysis

A premise underlying Alternative A is that continuation of past and ongoing trends in watershed, vegetation, and related environmental conditions would result in continued deterioration in ecological system health in the Great Basin and Ely District. Implied therein is a continued risk of frequent and potentially large-scale wildfires across the District. A possibility exists that the combined effects of continued deterioration in ecological system health and the consequences of wildfire could precipitate one or more ecological threshold conditions being reached within the foreseeable future, say, 50 years, whereby some watersheds lose their remaining functionality, triggering statutory management responses, protections, or recovery programs (e.g., protections under the Endangered Species Act). In turn, those responses and protections, may constrain the Ely Field Office's capacity to manage the District effectively for multiple-use and sustained yield to meet a broad spectrum of the needs of present and future generations. To the extent that statutory management responses or protections emphasize wildlife, vegetation, and air and water quality, a possible implication of such responses is restrictions on other uses, including recreation, grazing, possible land disposal, and mineral development. Over the long-term, the cumulative effects of wildfire also could result in use restrictions, degraded water quality, or reduced commodity production that contribute to the regional economy. Over the long term, such effects have potentially far-reaching social and economic implications, both within and outside the District.

All alternatives assume increased funding for the Ely Field Office to implement watershed analysis and ecological system restoration activities. That funding would be over and above the Ely Field Office's base funding and future expenditures associated with wildfire suppression. The amount of funding varies by alternative. Some of the additional funding could flow through to cooperating federal, state, and local government entities, but no specific assumptions about the monetary sums or timing of such flow-through arrangements were developed for this analysis.



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All alternatives assume that the Ely Field Office would proceed with possible land disposal under the Federal Land Transaction Facilitation Act, the Lincoln County Conservation, Recreation, and Development Act, and other approved disposal mechanisms. No assumptions were developed regarding the geographic locations, specific parcels, or acquiring parties for possible future land disposals. Disposed lands could be acquired by state, local, and tribal governments for public purposes; by private parties for economic development purposes; or by individuals for commercial, residential, or agricultural uses.

Additional assumptions used in this analysis include:

- Possible land disposal would average 3,000 acres per year for all alternatives, except Alternative D. Alternative D contains a provision for no net loss of public lands in the planning area.
- Under all alternatives, the additional funding for watershed analysis and treatment plans is assumed to be allocated 15 percent to BLM staff and operating costs and 85 percent for contracted services to be provided by the private sector, state and local governments, universities, or quasi-public non-governmental organizations. The actual allocation and distribution among entities would vary over time.
- The same lands would not necessarily be subject to watershed analysis and treatment plans in any given year.
- Funding to design, install, build, and manage additional developed recreation sites would be from the Ely Field Office's base and supplemental budgets. No supplemental funding is assumed for future recreation improvements.
- Alternative A assumes \$500,000 in annual funding for watershed analysis and treatment plans.
- Alternative B emphasizes restoration of at-risk resources, increasing the rate at which the ecological health of public lands within the District is evaluated and treatment plans developed and implemented. Alternative B assumes \$10 million in annual funding for the Ely Field Office to achieve accelerated watershed analyses, treatment, and restoration.
- Alternative C emphasizes actions to facilitate community and economic development within White Pine, Lincoln, and eastern Nye counties, through management to support responsible commercial activities including commodity production, recreation, hunting, and tourism. Alternative C assumes \$5 million in annual funding to accomplish the watershed evaluation process, and to formulate and implement management treatment plans and fuels/wildfire risk reduction. Alternative C also would implement the use of stewardship contracting by the Ely Field Office to accelerate the pace of watershed restoration.
- Alternative D emphasizes the reduction of impacts to vegetation and restoration of properly functioning conditions across the District. Grazing and recreation use would be restricted to facilitate restoration and repopulation of wildlife species. Wildfire management would include minimal fire suppression except to



protect life and property. Assumed supplemental funding to implement Alternative D is \$500,000 per year above the Ely Field Office's base funding.

- Alternative E seeks a balanced management approach accelerating the rate of ecological restoration, while supporting recreation use, commodity production, and support for community and economic development across the District. Available funding of \$10 million per year, over and above the future base funding for the Ely Field Office, plus the use of stewardship contracting is assumed to implement Alternative E.

### **Interactions with Other Programs**

The economic and social conditions within the Ely District potentially would be affected by actions within all of the resource management programs stemming from their ties to individual, community, and societal economic and social well-being. However, the most direct linkages and potentials for affecting such conditions arise in conjunction with resource management activities in the vegetation, water, fish and wildlife, lands and realty, renewable energy, travel management and off-highway vehicle use, recreation, livestock grazing, native plant products, mineral extraction, and fire management resources and the agency's efforts involving coordination with American Indians and issues of particular concern to them. The primary linkages and interactions are described below.

Management activities affecting vegetation have multiple linkages to economic and social conditions because of the vegetation resource's ties to wildlife (hunting and outfitting), wildfire risk (economic and social well-being), recreation (local businesses and individual quality of life), livestock grazing (the ranch economy) and native plants (personal and commercial use). The management of fish and wildlife resources also is linked to individual social values and quality of life, as well as income for guides, outfitters and local trade and service establishments that cater to their operations.

Renewable energy, mineral development and lands and realty share linkages to future short-term and long-term job opportunities and incomes, as well as the potential to affect the general community and economic development outlook for the region. Community development in particular, and its implications for population growth, demands for public services and local government fiscal conditions, could be affected by possible future real estate disposal actions. In turn, the amount, location and timing of future development are factors in assessing the relative risks associated with fire management in the urban interface. Finally, the management of native plants is tied to the concerns of American Indians, both in terms of cultural significance and personal consumption.

Changes in travel and recreation resource management affect how, how many and where individuals and groups access and use the public lands. The changes in use patterns have potential economic implications for businesses, communities and local governments and quality of life and social well-being impacts on individuals, groups and institutions.

Unlike most other environmental resources, the RMP/EIS planning process does not include a resource program specifically focused on community economic and social conditions within the District. However, the



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vision statements for the Nevada BLM and the Ely Field Office (see Sections 1.3.2.1 and 1.3.2.2) include social and economic goals for the national, regional, and local communities. The assessment of potential impacts affecting the quality of the human environment, including economic and social conditions, is required under NEPA. The BLM is further required to consider such conditions and the potential impacts of its management actions on those conditions during the preparation of land use plans. The agency must manage public lands on the basis of multiple use and sustained yield to meet the needs of present and future generations (BLM Handbook H-1601-1, Appendix D). BLM regulations also mandate consideration of the consistency of the agency's land use plans with state and local government plans for the affected lands (see Section 1.9.1).

The linkages between local economic and social conditions and the resource programs, land use and management plans, and NEPA arise in the context of the range of program objectives and proposed management techniques to achieve those objectives. Implementation of those techniques, or in some cases, the lack of implementation, can alter the existing public use, access, economic stimulus, land use, resource production, and other relationships between the public lands, their management and the local and non-local stakeholders. In turn, individual and community responses to the altered relationships may manifest themselves across a range of economic and social impacts. Therefore, impacts to economic and social conditions and environmental justice are not discussed in terms of individual program interactions but rather the entire proposed alternative.

### Alternative A

**Economic Conditions.** Alternative A maintains current land use and management programs across the District. Consequently, fundamental linkages between the public lands, agency management actions, and local economic conditions would be maintained. For example, the agency would continue to process applications for utility and transportation rights-of-way to support mining, and dispersed recreation would be allowed across much of the District. Lands presently identified as suitable for possible disposal under various programs would remain eligible for potential disposal. The annual operating budget and staffing levels of the Ely Field Office would increase slightly by \$500,000 above recent levels of about \$17.1 million, adjusted for future inflation, and 147 employees, respectively. With 85 percent of the additional funding being channeled to contracted services, the Ely Field Office staffing could increase by 1 or 2 positions, with another 11 or 12 jobs in the private sector. Personal income across the District would increase by about \$210,000 per year. The Ely Field Office would continue to be among the largest employers in the District.

Wildfire management and suppression costs represent another source of economic stimulus into the local economy, although not easily predictable in terms of magnitude, timing, and location. The total federal expenditures for fire suppression in the District would be expected to increase for the foreseeable future under Alternative A.

Maintaining existing linkages between the District and the local economies does not imply the absence of change in future economic conditions. As illustrated in **Table 4.23-1**, population projections, which generally mirror economic trends, call for modest growth in Lincoln County but substantial declines in White Pine



**Table 4.23-1**  
**Project Population Growth, 2000 to 2020**

Year	Lincoln County	White Pine County	Nevada
2000	4,178	9,033	2,018,723
2010	3,953	7,008	2,690,078
2020	4,475	6,529	2,910,959
Net Change	297	(2,504)	892,236
Compounded annual growth rate	0.3%	-1.6%	1.8%

Source: Nevada State Demographer's Office 2002.

County. Only minor population changes are foreseen in the Nye County portion of the District. It should be noted that recent legislation (i.e. the Lincoln County Land Act and the Lincoln County Conservation, Recreation, and Development Act) may make these population growth estimates by the Nevada State Demographer's Office conservative.

Both Lincoln and White Pine counties are engaged in active economic development efforts to attract new industrial development, promote the region's outdoor recreation and western heritage resources to tourists, and attract retirees to live in the area. Those economic development efforts seek additional jobs, support to maintain the incomes of residents, stabilize county and community fiscal conditions, and enhance local economic diversity and sustainability. The latter objective derives in part from local awareness of the far-reaching shifts away from commodity-based rural economies, as well as the constraints to economic development imposed by the limited amount of privately owned land and corollary dependence on public lands and resources. While some future mineral development and associated short-term employment, population, and tax impacts likely would occur within the District under Alternative A, such activity likely would be short-term, repeating past cycles of relative growth and decline.

More far-reaching than the uncertain outlook for minerals development are the potential implications of declining ecological health and other management aspects of Alternative A. Current limitations on lands subject to lease for potential geothermal, oil and gas, and wind energy would remain across much of the District, limiting the likelihood for such development occurring. While future development and the associated economic stimuli foregone because of such limitations would not diminish the existing economic support provided by public lands in the District, the trends in declining ecological health do have the potential to erode that economic support.

Declining ecological health conditions and the Ely Field Office's constrained budget for restoration are seen as ultimately triggering management actions that reduce the levels of resource utilization having positive regional economic linkages. Such actions include reductions in permitted grazing use, the closure of more areas to off-highway vehicle use and off-road travel, and directly or indirectly limiting dispersed recreation use in connection with ACEC designations. Diminished ecological health and the after-effects of wildfires may detract from the perceived scenic and amenity values that are viewed as important factors in people's outdoor recreation and vacation travel route planning decisions, relocation decisions by retirees, and the amount of big-game hunting in the region. The after-effects of wildfire may also include degraded water



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quality with potential adverse impacts on municipal and agricultural water users. The relationships between ecological health and these other factors are not fully understood; however, a consensus view is emerging that the trends in ecological health are likely to adversely impact, rather than enhance, local economic and social conditions. Additionally, as pointed out by Perryman et al. (2003), the direct costs of wildfire suppression and rehabilitation throughout the Great Basin are considerable and increasing continually under current management approaches.

The economic implications of Alternative A include:

- Long-term employment decreases in White Pine County and modest job gains in Lincoln County until the Lincoln County Land Act disposal is completed and subsequent development proceeds. The economic effects of the Lincoln County Land Act are unrelated to the RMP and would be undifferentiated across alternatives.
- Completion of the Lincoln County Land Act land sale. Subsequent development of that land would trigger substantial increases in construction and other jobs in southern Lincoln County.
- Some future mineral and energy development is likely to occur, even though specific projects are not presently identified. Such development would generate new jobs and economic activity not reflected in the long-term forecasts for the region. However, the economic stimulus provided by these projects would generally be temporary or of limited duration and not expected to alter the underlying economic trends in the area.
- Government employment, particularly state government, would serve a vital role in the economic foundations of Lincoln and White Pine counties.
- The District faces large-scale increases in recreation demand due to projected population gains in Nevada and surrounding states. Nevada, along with neighboring California, Utah, and Arizona, were among the fastest growing states between 1990 and 2000, collectively gaining over 7.1 million residents during the decade. Continued strong population growth is projected in those states through 2020. The combined population of the four states is projected to increase by nearly 15.8 million residents by 2020 (see Table 4.23-2).

Table 4.23-2  
Projected Population for Nevada and Three Adjacent States from 2000 to 2020

Year	Nevada	Utah	California	Arizona	Four-state Total
2000	2,018,723	2,233,169	34,480,300	4,961,953	43,694,145
2020	2,910,959	3,371,071	45,821,900	7,363,604	59,467,534
Absolute Change	892,236	1,137,902	11,341,600	2,401,651	15,773,389
Percent Change	44	51	33	48	36

Sources: California Department of Finance, Arizona Department of Economic Security, Utah Governor’s Office of Planning and Budget, Nevada Department of Taxation.



- In the short-term, increasing demand would result in higher recreation use and associated increases in recreation spending and sales taxes, a portion of which accrue to local establishments and governments. The increased recreation pressure would be more concentrated in Lincoln County due to the proximity to Las Vegas and Interstate 15.
- Future recreation use may plateau over the long term as recreational access and use is limited across more of the District in response to environmental protection measures.
- Farm income and the numbers of farm jobs would decline as declining rangeland health triggers reductions in livestock grazing on public lands. One recent study estimated the average value of livestock grazing in terms of agricultural output at \$24.40 per animal unit month in Nevada. That study also ascribed a market value to the grazing permit itself (Resource Concepts 2001), although the BLM does not recognize such a value as it is tied to a permit, not a right.
- Unemployment in White Pine County would remain above the statewide average under Alternative A until out-migration reestablishes a balance in the labor market.
- Tribal operations and the personal consumption expenditures of individual tribal members in the District would continue to provide support for the local retail and service sectors.
- Total personal income would decline in White Pine County as the numbers of jobs and residents decline, but increase slightly in Lincoln County. Average per capita incomes among working households in White Pine County may climb due to the large share of government jobs, but the overall average would decline due to the effects of the large inmate population on the computation of average income.
- Temporary increases in employment, income, and trade for local establishments would accompany the construction of transmission lines and pipelines, wildfire suppression, and other activities that occur within the District but that have little or no long-term economic manifestations.
- The overall economic output of White Pine County would decline. The economic output of the Nye County portion of the District and of Lincoln County would see decreases in farm output tied to grazing. However, increases in other industrial sectors of Lincoln County's economy, tied to population and economic gains associated with recreation use and second home development, may offset those reductions.

**Fiscal Linkages.** Future land purchases, sales, and exchanges under Alternative A could affect the acreage of BLM-administered lands in the District. Each net acre of change would affect the entitlement acres for computing future payments in lieu of taxes in the respective counties affected by a land action. The reductions in entitlement acres are not material because population, rather than entitlement acreage, is the operative driver for computing those payments in the District. In other words, payments in lieu of taxes in the future would be a function of the size of the resident population. Thus, future receipts of payments in lieu of taxes in Lincoln County would remain relatively constant over time, absent development spawned by the Lincoln County Land Act, but increase dramatically following any future development and corresponding



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population growth. Based on projected population growth, annual payment in lieu of tax payments to Lincoln County would increase by about \$22,000 over the next 20 years. Payments in lieu of taxes in White Pine County would decrease by about \$86,000 annually as population declines, even as the allowable per capita payment increases.

Local fiscal linkages between the public lands managed by the BLM and local communities could be affected by land exchanges or federal land acquisitions in the region. Along with possible land disposals, such actions add or remove lands from the private tax rolls or incidentally affect other sources of revenues and expenditures. Such changes are likely to be relatively small initially, but increase over time. Local government expenditures for law enforcement and fire suppression could increase in response to the recreation and wildfire management of the public lands under Alternative A. The added pressure on expenditures would not necessarily be accompanied by increases in federal revenues.

Impacts to the levels, mix, and location of future recreation use and tourism in the region would affect the levels of consumer spending and, thereby, future sales tax receipts. Given the anticipated increases in overall recreation use, future sales tax receipts would rise over time. White Pine County and Lincoln County both may forego the full benefit of the increases by funding mechanisms in place at the statewide level that provide rural counties options to accept a guaranteed level of funding from a portion of the sales tax levy in exchange for foregoing revenues should receipts increase above that level. Local governments may opt out of the program, but such a decision is irrevocable. Hence, retail sales and sales tax receipts would need to increase dramatically and be expected to persist at those higher levels before local governments would choose to end their participation in the program.

Little change in payments in lieu of taxes payments to Nye County would be expected as a result of changes within the Ely District under Alternative A.

Over time, grazing fee receipts collected by the agency would decline as temporary or permanent reductions in livestock grazing are enacted in response to declining range productivity. Subsequent distributions of those fees include 50 percent to the range improvement fund in the District of origin and 12.5 percent to the state for distribution to the counties. Any reductions in future grazing consequently would correspondingly reduce grazing fee revenues returned to the District.

The long-term reductions in livestock grazing could undermine the continued economic viability of one or more ranching operations in the region. Decisions to cease agricultural operations would have fiscal implications for local governments, depending on the subsequent ownership and use of the underlying real property.

Other changes in local fiscal conditions also would occur over time, for example, declines in the ad valorem tax base of White Pine County as housing values decline under Alternative A. However, such changes generally would be unrelated to BLM management of the District.

**Conclusion.** Alternative A would result in minor, long-term economic impacts (jobs, income, locally derived taxes, etc.) across the Ely District. Such impacts would intensify over time, accruing across the entire



District, though not necessarily uniformly. The adverse economic impacts in Lincoln County would be masked by major, long-term economic growth associated with the Lincoln County Land Act. The Lincoln County Land Act impacts are unrelated to the RMP and would be undifferentiated across alternatives. Federal payments in lieu of taxes and grazing fees received by White Pine County would decline by as much as \$86,000 annually, but increase in Lincoln County. Changes in payments in lieu of taxes and grazing fees would be minor relative to the total budgets of the affected local governments.

### **Alternative B**

**Economic Conditions.** The incremental direct and secondary impacts of the \$10 million in additional annual restoration funding on local employment and income under Alternative A include an estimated 255 to 260 additional jobs and \$4.2 million in annual income over most of the next 20 years. Staffing levels for the Ely Field Office could expand by about 10 percent (11 to 14 jobs) with an estimated 239 to 244 jobs in the private and local public sectors.<sup>1</sup> Over time, the cumulative temporary economic stimulus associated with wildfire suppression costs would be lower under Alternative B than under Alternative A.

Projected total annual personal income associated with Alternative B is \$4.2 million within the District. Though the incremental funding supporting the income would be channeled through the Ely Field Office, the added economic benefits stimulated by the income would accrue across the region based on the residency pattern of the employees and the geographic distribution of vendors and contractors supporting the program and their expenditure patterns. Those patterns may vary over time in response to shifting geographic distribution of the watershed analysis and treatment priorities.

Incremental changes in employment, economic output, and personal income growth, relative to the No Action Alternative, may stem indirectly from management actions and enhanced restoration activities associated with Alternative B. Potential sources of such indirect economic stimuli include the following:

- Construction and operations of mineral, utility, and renewable energy facilities accommodated by changes in land use management policies facilitating more development of these resources in the future.
- The District faces major increases in recreation demand, particularly for off-highway vehicle use. Demand for hunting, fishing, and other forms of dispersed and developed recreation also would increase. The closure of 1.2 million acres to off-highway vehicle use, limiting use to designated roads and trails on another 10 million acres would temporarily reduce off-highway vehicle use and the associated economic stimuli or result in a geographical redistribution of recreation spending tied to changes in off-highway vehicle use patterns as compared to Alternative A.

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<sup>1</sup>These estimates reflect the default 15 percent BLM / 85 percent contracted services allocation of the additional restoration funds. Variances in allocations from the default assumption would result in some shifting of the employment impacts between the Ely Field Office and other entities, but the order of magnitude of the total job and income impacts would not be substantially different from the levels shown above.

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- Over the long-term, and contingent on the Nevada Department of Wildlife management decisions, big-game hunting levels and the economic stimulus associated with outfitting and guiding could increase as elk, desert bighorn sheep, and Rocky Mountain bighorn sheep ranges and populations expand.
- Farm and ranch income of individual operators holding grazing permits would be adversely affected by temporary restrictions on livestock grazing on allotments undergoing restoration and total closure of 13 additional allotments within the Mojave Desert and partial to total closure of many more allotments in areas of occupied or historic bighorn sheep habitat. Following treatment, livestock stocking rates could return to pre-treatment authorization levels. The loss of income would depend on the individual operator's relative dependence on the affected allotment, the availability and affordability of alternative grazing or feed, and the operator's ability to adapt to changing livestock management conditions. The number of operators could decline under Alternative B.
- Over the long-term, farm and ranch employment and income would be reduced in relation to Alternative A, due to the elimination of grazing on the remainder of the Mojave Desert and reductions to accommodate the expanded ranges for desert bighorn and Rocky Mountain bighorn sheep. These reductions would be partially offset by long-term stabilization and improvements in rangeland health achieved under Alternative B.
- Potential industrial development opportunities supported by woodland commodity availability (e.g., pinyon-juniper processed for fence posts, fuel pellets, or other commercial products). The accelerated treatment rates would increase biomass availability, both in terms of quantity and variety, enhancing the commercial viability potential. However, the geographic size of the District and its implications for the concentrations of resource availability and distances to processing locations and markets may temper the extent of commercial activity.
- Increased commercial and industrial development opportunities spawned by future residential development in response to the land disposal process and indirect consequence of enhanced "lifestyle" migration to the area in response to the accelerated rangeland and watershed restoration efforts.

The magnitude and location of the indirect employment and income growth are subject to the caveats and uncertainties identified above in connection with population change. Many of the potential indirect gains associated with Alternative B would enhance the long-term economic stability and sustainability of the local economy by reducing the dependence on extractive-resource development.

The three Indian Reservations would not experience direct economic impacts from management activities under Alternative B. Increased economic opportunities may result indirectly from the development of any lands transferred to the Tribes or from overall changes in economic conditions related to commodity use, recreation, livestock grazing management, or participation in the ecological restoration programs funding under Alternative B. The magnitude of such economic effects is unknown due to uncertainty regarding the timing, amount, and future use of any possible land disposal or other actions and the extent to which future economic enterprises would be Tribal undertakings or activities undertaken by individual members.



**Fiscal Linkages.** Impacts to the established fiscal linkages and future conditions would not be substantially different for Alternative B than those under Alternative A. Possible land disposal actions would decrease the number of entitlement acres in the respective counties. The District's vast size diminishes the influence of the entitlement acres in determining payments in lieu of taxes as compared to that imposed by the District's small population base. White Pine, Nye, and Lincoln counties collectively would garner about \$38,000 per year in additional payments in lieu of taxes under Alternative B as compared to Alternative A. Induced population changes spawned by other changes in management are too speculative to project, but they would result in corresponding gains or reductions in payment in lieu of taxes. Local taxing entities could realize expansions of their respective ad valorem tax bases due to additions associated with potential land disposal and the economic activity associated with the annual budgets for enhanced restoration.

Grazing fees collected in the District, a portion of which are distributed locally, are expected to decline over time under Alternative A. Similar trends also may occur under Alternative B. However, enhancements in rangeland health could arrest the declines such that the levels of grazing and grazing fee receipts are above those under Alternative A.

Local communities would benefit indirectly from the reductions in wildfire risks associated with the comprehensive watershed analysis, vegetation treatment, and other management techniques included in Alternative B. Over the long-term, the reductions in risk also would result in reduced pressures on local law enforcement and fire suppression support.

**Conclusion.** Alternative B would result in minor, long-term enhancements of the local economy, e.g., 255 to 260 jobs, across the Ely District due to the added restoration funding, enhanced woodland commodity availability, and increases in big-game hunting. Gains would be tempered by long-term decreases in farm/ranch income from allotment closures in the Mojave Desert and bighorn sheep habitat. Lincoln County would see major, long-term economic growth triggered by the Lincoln County Land Act. Annual payments in lieu of taxes to White Pine County would be lower than at the present, but higher than under Alternative A. Payments in lieu of taxes would increase in Lincoln County. RMP-related impacts on local fiscal conditions would be minor and long-term relative to local budgets.

### Alternative C

**Economic Conditions.** Implementation of Alternative C would result in marginally higher employment and personal income across the District relative to Alternative A. The increases would result from the incremental direct and secondary jobs supported by the additional \$5.0 million in the Ely Field Office annual operating budgets. The estimated employment increment is 125 to 130 jobs for the 15 to 20 years required to complete the District-wide watershed analysis and treatment program.<sup>2</sup> The total impact would be comprised of 8 to 12 additional BLM staff and 117 to 122 jobs in the private sector or in local and state government. The total increment is about 116 jobs above the impact associated with Alternative A. Implementation of stewardship contracting would yield additional new job opportunities. The initial creation

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<sup>2</sup> These estimates reflect the default 15 percent BLM / 85 percent contracted services allocation of the additional restoration funds. Variances in allocations from the default assumption would result in some shifting of the employment impacts between the Ely Field Office and other entities, but the order of magnitude of the total job and income impacts would not be substantially different from the levels shown above.



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of these jobs would likely lag the watershed analysis process, due to the need to develop treatment programs, complete site-specific environmental compliance, and advertise and award contract or enter into cooperative agreements. The number of supportable jobs is unknown, due to a lack of information regarding the number, type, location, marketable product values, and services to be provided via stewardship projects. Employment impacts beyond the RMP/EIS time horizon would depend on budget availability and subsequent management direction.

Investment in restoration activities and the management emphasis on enhancing of commercial activities could spawn development of specialized facilities and services (e.g., a native plant materials nursery) in the District. Such developments, if realized, would bring added economic development and jobs to the region beyond the levels projected above. The economic stimulus would be augmented by increased expenditures associated with full suppression of wildfires. The level of such expenditures would logically vary from year-to-year and would likely tend to increase over time as heavy fuels accumulate in untreated acres. Although the additional funding for ecological restoration would be channeled through the Ely Field Office, the watershed analysis and treatment efforts, and hence, the employment opportunities and other associated economic benefits, would be dispersed across the District.

Alternative C would promote increased organized and developed recreation activity in the District, compared to Alternative A, and the development of tourism and recreation-oriented facilities by both the public and private sectors. Higher levels of organized use would be counter-balanced by reductions in dispersed off-highway use due to restrictions on use to designated roads and trails across much of the District. The former would stimulate recreation spending in the region, providing added stimulus to local retail, eating and drinking, overnight lodging, and other such establishments and increases in the number of local jobs in the affected industries. However, those gains would be offset by reduction in spending by off-highway vehicle users such that the net impacts cannot be determined with the available information.

Alternative C also could promote short-term local economic development benefits associated with commercial development opportunities of biomass made due to the enhanced availability, accessibility, and lower commodity costs afforded by the fuels management/wildfire risk reduction efforts focused around local communities. In remote areas of the District, harvesting and transportation costs may pose substantial barriers to the development of forest products processing and manufacturing. The active suppression of all wildfires may also poses a risk of large-scale, uncontrollable wildfires occurring in untreated areas, with attendant potential adverse economic impacts.

Commercial use opportunities under Alternative C would allow District-wide harvesting of additional species of trees, live trees, cactus and yucca collection, and the mechanical harvesting of pinyon pine nuts, subject to the constraints imposed by Nevada Revised Statutes 527.050-120. This management provision may encourage landscaping suppliers and contractors serving Las Vegas and other urban markets to explore the commercial viability of local operations. Stewardship contracting, which would provide opportunities for the BLM to exchange the value of products for restoration services provided, may enhance the commercial viability of such operations.



A larger and more geographically dispersed area of lands would be designated as available for possible disposal and ultimately for industrial, commercial, residential and agricultural uses under Alternative C, although the average land area of the annual possible disposals is assumed to remain at 3,000 acres per year. The extent, timing, and location of subsequent development would depend on the identification of viable markets, individuals, or companies with the expertise and financial resources to start and operate new businesses, and the capability of communities to support such development. To the extent that such development occurs, it would contribute to increases in local employment, income, and economic diversity and sustainability within the District. Such development would boost construction employment in the affected communities. Uncertainties regarding the timing, location, and eventual use of possible land disposals preclude estimation of the indirect employment and income effects that could stem from Alternative C.

Short-term impacts on farm and ranch income tied to temporary restrictions on livestock grazing during treatment under Alternative C would be similar to those described for Alternative B. Fewer allotments within the Mojave Desert would be totally closed than in Alternative B, resulting in less impact to farm and ranch operations than under Alternative B. Other individual operators temporarily could be affected during restoration on any individual allotment. The loss of income would depend on the individual operator's relative dependence on the affected allotment, the availability and affordability of alternative grazing or feed, and the operator's ability to adapt to changing livestock management conditions. Temporary nonrenewable use may buffer impacts in some years. Temporary impacts also could be tempered by the establishment of a forage reserve as could be authorized under Alternative C.

Over the long-term, restoration could allow livestock grazing levels to increase above pre-treatment authorized levels, because additional forage would be allocated to livestock. Under such circumstance, Alternative C would have a net positive impact on grazing and local farm income, as compared to the No Action Alternative. Such benefits may be enhanced in the short term by the increased commercial woodland and native plant commodity production. On a long-term basis, however, the fire suppression policy of this alternative would lead to increased risk of major wildfires resulting in substantial reduction in availability of woodland products.

**Fiscal Linkages.** The direct effects on established and future fiscal linkages associated with the BLM's management of the District and local governments in the region would be comparable to those under Alternative B, because both are based on \$5.0 million in higher annual expenditures. However, while the net reduction in entitlement acres would be the same across all alternatives, the expanded offerings of lands available for possible disposal and the enhancement of commercial recreation and other business opportunities could result in more induced population growth and higher future payments in lieu of taxes. The relative impacts would be greater in Lincoln County than in White Pine or Nye counties.

Future land disposal and subsequent development also would expand the ad valorem tax base of local governments and school districts. Higher volumes of retail sales to residents, travelers, and participants in organized recreation events would increase sales tax receipts, though the net impact is unclear due to anticipated reductions in off-highway vehicle use.



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**Conclusion.** Alternative C would promote increased organized and developed recreation activity in the District, compared to Alternative A, and the development of tourism and recreation-oriented facilities by both the public and private sectors. Higher levels of organized use, in the form of truck and motorcycle events, would augment continued OHV use accommodated by a management emphasis to designate roads and trails for such use. The combined organized and dispersed recreation use would stimulate recreation spending in the region, providing added stimulus to local retail, eating and drinking, lodging and other such establishments, which would increase the number of local jobs in the affected industries.

### Alternative D

**Economic Conditions.** The direct and secondary employment and income effects of the ecological restoration efforts under Alternative D would be equivalent to those under No Action Alternative given the \$500,000 annual increase in the annual operating budget of the Ely Field Office. Local economies would experience reduced economic benefit from wildfire management activities, because of the minimal fire suppression policies under Alternative D and also would be at risk of adverse economic impacts due to resource degradation and loss due to the wildfire.

The elimination of grazing on public lands in the Ely District under this Alternative would result in long-term direct and indirect economic impacts to area ranchers, affiliated agri-business firms and other trade and service sectors of the economy. The impacts would accrue as many of the region's farmers and ranchers are forced to trim or eliminate cattle and sheep herds due to the loss of public grazing forage and lack of replacement grazing on private or other public lands. The reductions in herd sizes would eliminate revenues from livestock marketing. Such revenues were nearly \$13 million in 2002. The loss of public grazing may force some ranchers to cease their agricultural operations entirely. Other farmers and ranchers may offset a portion of the loss from increased sales of hay no longer required for winter feed, but the net effect would likely be a substantial reduction in overall farm income. The withdrawals of lands open for mineral, geothermal, and wind energy development and the lack of new utility corridors would preclude realization of potential future temporary and long-term economic benefits from such development.

Temporary and short-term construction effects attributable to residential and commercial construction would be lower under Alternative D than under the other alternatives.

**Fiscal Linkages.** Alternative D stipulates no net loss of public lands in the area. Given that policy, the established fiscal linkages between the BLM's management activities on public lands and local communities would be maintained, because future land disposal would require an offsetting acquisition of lands from private or other non-federal parties. Consequently, changes in future payments in lieu of taxes would be comparable to those under Alternative A.

The indirect consequences of this policy would be of more importance to local communities and generally would be adverse relative to Alternative A. The loss of future development potential and the associated implications for future population growth would diminish the potential for increasing future receipts of payments in lieu of taxes in Lincoln County, local ad valorem tax revenue generating capacity, and transfers for education and other public functions from the state. Local distributions of grazing fees would be



eliminated with the closure of all allotments. Farmers, ranchers and others in the community adversely affected by the elimination of public grazing would experience a substantial diminishment in their individual and collective quality of life. Furthermore, they would see the erosion of agricultural viability in the district as a loss of an important dimension of the region's social and cultural underpinnings.

**Conclusion.** Alternative D would result in major, long-term economic impacts, due to substantial reductions in ranch income, wildland fire suppression, and withdrawals of lands open for mineral and energy-related development. The latter could result in foregone short-term economic benefits associated with utility construction projects precluded by the lack of utility corridors. The Lincoln County economy would experience major, long-term economic growth associated with development of lands sold under the Lincoln County Land Act. Annual payments in lieu of taxes to White Pine County would be lower than at the present, but comparable to those under Alternative A. The provision for no net loss of public lands may delay or limit land disposal actions that would otherwise foster community and economic development, thereby impacting local fiscal budgets.

### **Alternative E**

**Economic Conditions.** The direct and secondary impacts of Alternative E on local employment opportunities and income would be comparable to those described under Alternative C; an estimated 255 to 260 additional jobs and \$4.2 million in annual income over the next 20 years. Staffing levels for the Ely Field Office could expand by about 10 percent (11 to 14 jobs) with an estimated 239 to 244 jobs in the private and local public sectors.<sup>3</sup> Although funding for ecological restoration would be channeled through the Ely Field Office, the watershed analysis and treatment efforts, and hence, the employment opportunities and other associated economic benefits, would be dispersed across the District. Investment in restoration activities could spawn the establishment of specialized firms and services (e.g., native plant nursery) in the District, bringing added economic development to the region beyond the levels projected above. Implementation of stewardship contracting would yield additional new job opportunities. The initial creation of these jobs would lag the watershed analysis process, due to administrative, environmental compliance, and contract requirements. The number of supportable jobs is unknown.

The indirect economic consequences associated with Alternative E with respect to promoting recreation use would alter the level, mix, and distribution of developed and dispersed recreation across the District. Dispersed, individual off-highway vehicle use would become more concentrated relative to Alternative A; but would likely continue to increase in magnitude. Developed recreation and use in conjunction with organized events also would increase. Future levels of big-game hunting may increase as expanding ranges and populations allow the Nevada Department of Wildlife to increase the number of tags issued. Limitations on the issuance of outfitter and guide permits leave the total income generated by these activities unaffected, but channel it through fewer outfitters, or reduce the overall income generated, depending on the number of permits issued. Personal and commercial use of woodland commodities would be expanded over Alternative A. Commercial use would not be emphasized to the same extent as under Alternative C, with

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<sup>3</sup>These estimates reflect the default 15 percent BLM / 85 percent contracted services allocation of the additional restoration funds. Variances in allocations from the default assumption would result in some shifting of the employment impacts between the Ely Field Office and other entities, but the order of magnitude of the total job and income impacts would not be substantially different from the levels shown above.



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more actions evaluated on a case-by-case basis. Livestock grazing would be available on approximately 11.2 million acres within the District, but subject to fluctuations necessitated by restoration initiatives, adjustments for ecological health, the creation of forage reserves, and achievement of other management objectives.

A wider array of lands would be available for industrial, commercial, residential, and agricultural uses under Alternative E, but the rate of possible disposal would remain at an average of 3,000 acres per year. The timing, type, and extent of subsequent development would depend on the identification of viable markets, individuals, or companies with the expertise and financial resources to start and operate new businesses, and the capability of communities to support such development. To the extent that such development occurs, it would contribute to local employment and income growth and provide a measure of economic diversity and sustainability across the District. Such development would boost short-term construction employment in the affected communities. Uncertainties regarding these factors preclude estimation of the indirect employment and income effects that could stem from Alternative E.

Alternative E would result in temporary restrictions on livestock grazing that could affect the incomes of operators whose grazing privileges would be displaced. Authorizations of temporary nonrenewable use and establishment of a forage reserve could reduce the impact on income. Over the long term, the Alternative E could have a net positive impact on grazing and local farm income, as compared to Alternative A, in the event that some share of the gain in available forage is allocated to livestock and wild horses.

**Fiscal Linkages.** The effects of Alternative E on established fiscal linkages between the public lands and local governments and businesses in the region would differ from those described under Alternative A based on its support for additional employment and population in the region. Over the long-term, Alternative E would generate higher payments in lieu of taxes and higher grazing fee receipts, a portion of which would return to the local economy.

Future land disposal and subsequent development, combined with the positive effects of the higher employment and population in sustaining real estate values, would boost the ad valorem tax base of local governments and school districts relative to Alternative A. Increases in the ad valorem tax base generally are perceived as beneficial. Net changes in the levels of retail sales to residents, travelers, and outdoor recreationists and sportsmen would affect future levels of locally generated sales taxes. However, the net changes in sales may not translate directly into corresponding changes in local sales tax receipts because of provisions in Nevada's local government financing structure that provide rural governments protection against declining sales tax revenues in exchange for a guaranteed level of revenue and foregoing any short-term revenue increases in excess of the guaranteed amount.

**Conclusion.** Alternative E would result in minor, long-term enhancements of the local economy, e.g., 255 to 260 jobs, across the Ely District due to the added restoration funding, stewardship contracting, increased woodland commodity production, and developed and organized recreation. Ranch income would be adversely impacted over the short term, but would increase over the long term. Annual payments in lieu of taxes to White Pine County would be lower than at the present, but would increase in Lincoln County. RMP-related impacts on local fiscal conditions would be minor and long term relative to local budgets.



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## 4.24 Social Conditions

### Alternative A

**Population and Demographics.** The Nevada State Demographer's office has prepared statewide and county-specific population projections through the year 2020. The projections are based on the continuation of recent population and demographic trends, and thus, can be viewed as generally consistent with Alternative A. As such, they provide an indication of expected future economic and social conditions in the region absent any major economic shocks, including changes in BLM management activities of the Ely District.

Lincoln County is projected to gain nearly 300 residents through 2020; a modest compounded annual growth rate of 0.3 percent (see **Table 4.23-1**). Those projections do not include allowances for future development in conjunction with the sale and development of lands associated with the Lincoln County Land Act. Such development could result in nearly 58,000 additional residents of Lincoln County over 20 years (BLM 2001b). The effects of the Lincoln County Land Act on Lincoln County population growth, demographics, and social conditions are unrelated to the RMP and would be undifferentiated across alternatives. Absent the growth associated with the Lincoln County Land Act, these projections imply limited net immigration to augment natural growth of the resident population.

The corresponding projections for White Pine County call for long-term population losses of more than 2,500 residents by 2020. About 80 percent of the projected decline would occur by 2010 with the rate of decline slowing thereafter. The location of two regionally important highways through the county, and the support for local trade and services establishments provided by the Ely State Prison, the stimulus provided by the recent reopening of the Robinson mine, and other state and federal government activities in the county, suggests that White Pine County's population may stabilize, rather than continuing to decline as projected. The implications of the projections are, however, for substantial net residential out-migration, with attendant effects on local housing markets and other social dimensions of the affected communities. Under such conditions, the median age of an area's population would tend to increase, and the number of school-age children would decline.

Population projections are not available for the Nye County portion of the District. Population declined between 1990 and 2000, at least partially in response to limited economic opportunity. Given the outlook for population declines in White Pine County, to which the Duckwater area maintains close economic and social ties, it is reasonable to expect some further declines.

Projected population changes in the District contrast sharply with those for Nevada where net gains of over 892,000 residents are projected statewide by 2020, raising the state's population to 2.91 million.

**Housing.** Housing is among the more important elements of community development and local socioeconomic conditions. To an extent, changes in housing conditions and markets serve as a proxy for changes in community infrastructure and functioning. Rapid growth and strong housing demand tends to be correlated with rising housing prices, the need for community infrastructure expansion and increased



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pressure on community services, while falling demand and prices create strains as communities attempt to sustain services and economic vitality in the face of declining resources.

Alternative A would have little, if any, direct impact on the underlying markets for new housing in the region. Lincoln County's housing market would be comprised of three segments: 1) demand for permanent housing to accommodate new residents moving to the central portion of the county, 2) non-resident demand for homes for seasonal and recreational use, and 3) the potential development of lands in southern Lincoln County associated with the Lincoln County Land Act. The first two of these segments would affect private lands, primarily around Panaca, Pioche, and Caliente. The amount of land to support such development is limited, providing a need for additional lands. Lands identified for possible disposal to meet community expansion needs could satisfy such demand, provided lands are subsequently developed for residential, rather than agricultural, industrial, commercial, or other public uses. The demand for seasonal and recreational use homes could be adversely affected by the continued risk of wildfires on nearby public lands and restrictions enacted on dispersed recreation and off-highway vehicle use in the wake of continued decline in ecological health.

The land sale under the Lincoln County Land Act is congressionally mandated. Market forces would determine whether, and when, development proceeds and the nature of that development. The impact of that development on other development trends in Lincoln County is unclear.

Housing demand in White Pine County would decline over the long-term in response to population declines and out-migration that characterize Alternative A, although the long-term trend could be punctuated by short-term increases in demand tied to renewed mineral development or other temporary or cyclical spikes in economic activity. Under the long-term trends of relatively weak demand, housing values would decline and vacancies would rise above the 26 percent registered in the 2000 census. The population declines would result in excess service capacity in public infrastructure, along with diminished fiscal capacity for upgrades, maintenance, and repairs. Public services also would be adversely affected as cutbacks are necessitated by the smaller population base and fiscal resources.

**Social Values and Attitudes Regarding Public Land Management.** Continuation of current management practices under Alternative A would be deemed by many stakeholders as being unresponsive to their multi-faceted and wide-ranging concerns. Whether local resident, non-resident recreation enthusiast, Tribal interest, or a business or environmental organization, generally there is a broad consensus that current conditions and trends do not bode well for the long-term environmental, economic, and community well-being of the District. There is considerably less consensus regarding the priorities and desired outcomes for future management of the District. In part, this stems from the sheer size of the District and its pivotal role in the Great Basin ecological system. Not only does the large size provide an opportunity for stakeholders to influence management for a vast area in its own right, but the current RMP/EIS process is seen as providing a forum to influence management policies over much of the western U.S. One outfall of the attention directed toward the Ely RMP/EIS is that most stakeholders and interest groups see themselves as having something at risk, which may or may not promote consensus regarding the desired course of action.



Two trends emerge under the current management that generally characterize the implications of Alternative A in terms of the effects on social values and attitudes toward public land management. On the one hand are local individuals and groups whose economic livelihoods and quality of life are linked to public lands and those who visit the area frequently to hunt, recreate, experience, and enjoy the open space and scenic vistas. Many of these individuals believe that their opportunity to maintain their established use patterns, cultural ties, and other connections to the land are threatened by strict environmental resource protection. An implication of that eventuality is that these parties see themselves as bearing the brunt of forthcoming changes in management and that those changes generally are viewed as being adverse in nature. They are, therefore, inclined to support more active and aggressive management that stabilizes, and hopefully, restores ecological conditions over time to a point of supporting on-going multiple use across a large portion of the District.

A contrasting perspective of the need for action may be held by individuals and groups promoting more active restoration efforts from a more distant or detached vantage, be it scientific, cultural, emotional, or spiritual. Many among these stakeholders also recognize that environmental protections eventually would come into play across broad segments of the District. However, there are potentially avoidable adverse consequences associated with delays and the passage of time that motivate these stakeholders to support more active and aggressive restoration efforts. One such consequence is the increasing risk of wildland fires. Such fires would increasingly pose risks to communities, lives, and properties. While such risks raise concerns for local residents, property owners, and officials, the consequences of wildland fires on ecological resources also can be devastating and are something to be avoided, if possible.

It is the shared motivation that changes in management are necessary to address concerns that Alternative A fails to address.

**Conclusion.** Long-term moderate to major population declines in White Pine County and moderate to major population increases in Lincoln County are projected under Alternative A. Subsequently, housing demand and prices would fall in White Pine County, while increasing in Lincoln County. Residential development in Lincoln County would increase concerns about wildland fire risks. Continuation of current management practices would be widely perceived as unresponsive to public concerns regarding declining ecological health in the Great Basin and the implications for public land use.

### **Alternative B**

**Population and Demographics.** Effects on regional population change directly attributable to the BLM's operations under Alternative B are estimated at 510 to 560 residents across the region during the 15 to 20 years required to complete the District-wide watershed analysis and treatment program. The increase would result from the additional job opportunities supported in the District by the additional \$10 million in annual operating budget for the Ely Field Office. Many of the affected households would live in and around Ely, attracted by the location of the Ely Field Office, the community's retail and services sector, and the relative availability of housing. Others may choose to live in nearby unincorporated areas of White Pine County or in Lincoln County, primarily in and around Caliente where the BLM operates a Field Station. The



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changes in the population of White Pine County would not manifest themselves as new growth per se, but rather as a relative decrease in the level of expected out migration.

The three American Indian reservations would not experience population growth directly as a result of Alternative B, because like the non-reservation communities in White Pine County, the effect of Alternative B would be one of stemming out migration rather than generating net growth. Induced population growth may result indirectly from the development of any lands transferred to the Tribes as part of a larger community and economic development conveyance and disposal process outside the context of the RMP/EIS. The Duckwater Shoshone and Ely Shoshone both have expressed interest in gaining additional lands to expand their respective reservations. The population effects associated with any such transfers is unknown due to the uncertainty regarding the timing, amount, and future use of any such transfers.

Population growth indirectly associated with possible land disposal under Alternative B may occur elsewhere in the District. The magnitude and location of such growth is subject to the same caveats and uncertainties identified earlier in connection with the reservations. Over an extended time, the incremental growth could come to represent a sizeable population in Lincoln County, assuming residential development of some of the disposed lands.

Through its accelerated effects on improving ecological health, implementation of Alternative B could indirectly contribute to a higher future population in the region, as compared to the No Action alternative. The higher population could manifest itself as additional growth in Lincoln County or less population loss in White Pine County. To the extent that environmental conditions are "quality of life" factors affecting the residential choices of retirees, entrepreneurs, and working households with a high degree of flexibility in their employment situation, the potential improvements achieved under Alternative B would diminish the adverse influences of the current conditions and trends. The temporal relationships between the implementation of Alternative B, responses and changes in ecological health, potential indirect effects on population change, as well as the magnitude of such population changes, are unknown.

Population effects associated with Alternative B would have little effect on the demographic characteristics of the District. Some affected individuals already reside in the District and would maintain their current residency. Households who move likely would represent a broad demographic cross-section in terms of age, workforce participation, and household size.

**Housing.** Local housing markets would experience little direct impact under Alternative B due to the limited scale of the anticipated population effects and the favorable availability and housing costs that would characterize Alternative A, the no action alternative, particularly in White Pine County. The additional demand generally would be regarded as beneficial. The incremental demands on community infrastructure and public services also would be considered beneficial by contributing to higher utilization, efficiency, and local government fiscal capacity.

Indirect effects on local housing markets could arise from future residential development on lands disposed of under Alternative B. While the timing and absorption of such lands is uncertain, such impacts are more likely in Lincoln County, particularly around Pioche, Panaca, and Caliente, than in White Pine County or the



portion of Nye County within the District. Development around those communities could take advantage of and benefit the established community infrastructure. Active housing markets in Lincoln County would include both permanent residency and second-home/recreational use. Lincoln County's housing market is not expected to suffer from the high vacancy rates characterizing the White Pine market under Alternative A.

**Social Values and Attitudes Regarding Public Land Use Management.** Alternative B responds to a broadly held perspective that current conditions and trends in ecological health require a substantial commitment of agency resources to arrest the rate of decline and begin restoration of properly functioning conditions across much of the District. While many stakeholders would view favorably the increased funding levels and accelerated process of assessment and adaptive management response, the uncertainties regarding the effectiveness of that approach and the lengthy time required for implementation and the resulting ecological responses could foster concerns among various stakeholders about potential short-term effects. For example, ranchers would oppose the reductions in livestock grazing privileges associated with the closure of the Mojave Desert to grazing and the emphasis given towards expanding the ranges and populations of desert and Rocky Mountain bighorn sheep, particularly given the lack of future forage allocations to livestock grazing as standards for rangeland health are achieved. They would see this as detrimental to their own sense of social and economic well-being, as well as that of their neighbors and their collective descendants.

At the same time, many residents (e.g., ranchers, home and business owners closest to the urban/rural interface) of the area would value the added emphasis directed towards fuels management and wildfire risk reduction included in this Alternative. Many residents and non-residents familiar with the area also would value the expanded range of woodland and native plant products available for personal use.

Local and Tribal government officials interested in promoting economic development initiatives would support the designation of areas for possible disposal, though some still would consider it insufficient to meet future needs.

Stakeholders interested in ecological restoration and resource protection, as well as some of those interested in increased opportunities for off-highway vehicle use, would experience some degree of dissatisfaction with Alternative B, because it may not include the scale of management response they desire. For example, some groups interested in environmental restoration would like to see a complete and immediate cessation of grazing. At the same time, individual off-highway vehicle enthusiasts and organizations may prefer maintaining more open use areas, fewer travel restrictions limiting use to designated roads and trails, and not closing an additional 302,000 acres to off-highway vehicle use.

**Conclusion.** Alternative B would increase regional population by 510 to 560 residents during restoration. Generally perceived as beneficial, the gains would be relatively more concentrated around Ely. By accelerating the pace of restoration and improved ecological health, Alternative B would contribute to potential long-term population growth over and above that under Alternative A. Higher population would bolster housing markets in White Pine County. Many would view the increased restoration funding levels favorably, but would be concerned about short-term impacts on lifestyles and personal use, and future



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management decisions as rangeland health standards are achieved. Alternative B may hold relatively stronger appeal to those favoring resource protection and restoration.

### Alternative C

**Population and Demographics.** The population effects of Alternative C would be comparable to those identified for Alternative B; a net incremental increase over Alternative A supported by the additional \$5.0 million in annual operating budget for the Ely Field Office. Implementation of stewardship contracting would spawn additional population gains. The magnitudes and timing of the gains generally would correspond to the employment effects associated with such contracting, which are presently unknown.

A secondary consequence of emphasizing responsible commercial development of woodland and native plant products, organized motorized recreation events, and the expanded options of lands designated as suitable for possible disposal is a higher likelihood of stimulating induced economic and population growth beyond that associated directly with the rangeland health restoration initiative. Indirect effects on regional population change under Alternative C would be greater than under the other alternatives because of the increased acreage available for possible disposal. Most of the additional lands designated as eligible for possible disposal under Alternative C are near Ely, communities in Lincoln County, local airports, existing state parks, and other popular recreation areas. The location of these lands would promote interest for public and private sector recreation-oriented, commercial, and residential development, as well as possible agricultural uses. Such development would increase both the full-time residential populations and the seasonal and part-time residents. Criteria established to facilitate the orderly disposal of lands likely would result in paced disposal over time, with subsequent possible disposals contingent upon the utilization, market absorption, and development of previously disposed lands. The indirect effects on population growth would likely be concentrated in Lincoln County due to the proximity to the Las Vegas metropolitan area, Mesquite, and the Interstate 15 corridor.

The social well-being of the three Indian Reservations and respective Tribal members and households would not be directly affected by possible land disposal or other aspects of Alternative C.

**Housing.** Local housing markets would experience little direct impact under Alternative C because of the limited scale of population effects anticipated and the existing market conditions described under Alternative A. The incremental demands on community infrastructure and public services also would contribute to higher utilization, efficiency, and fiscal support.

Indirect effects on local housing markets could arise from future residential development on lands disposed under Alternative C. The timing and absorption of such lands is uncertain, but such effects would more likely to occur around Pioche, Panaca, and Caliente in Lincoln County, and in areas in White Pine located near, and having access to, designated off-highway vehicle open use areas. The level of second-home development potentially could be much higher under Alternative C than other alternatives because of the proximity of possible disposal-eligible lands to established recreation areas.



A secondary consequence of new development in more remote locations would be to alter and increase demands on local governments, the BLM, and other public service providers. For example, increased residential and commercial development outside of the established communities in Lincoln County would increase demands on the sheriff's department, local fire protection, and, to the extent that they attract year-round residents, the school district. Increasing development also would generate additional management demands on BLM resources, including wildfire protection, by introducing more development, recreation use, and a higher general level of human presence into areas previously undeveloped.

**Social Values and Attitudes Regarding Public Land Management.** Alternative C may garner support among the diverse stakeholders for the increase in spending to implement pro-active restoration efforts, including the use of commercial development and stewardship contracting to effect fuels management/wildfire risk reduction and other environmental and recreation opportunity restoration and enhancement goals. Because such efforts may promote increased vegetation production and the availability of wood products biomass near local communities, local officials interested in community development likely would favor Alternative C over the other alternatives. Ranchers affected by closure of allotments within the Mojave Desert would oppose this reduction in livestock grazing privileges. Many off-highway vehicle users and other outdoor recreation enthusiasts would prefer the increase in recreation opportunities, less restrictive off-highway vehicle use designations, and private development afforded by the expanded offerings of land designated as suitable for possible disposal, relative to the other alternatives.

Groups and individuals interested in resource protection likely would be skeptical or opposed to the emphasis on commercial activities, the expansion of recreation uses (particularly motorcycle and organized truck events), and the expanded designations of lands suitable for possible disposal under Alternative C, particularly those areas seen as having high recreation potential and other resource values. Others would view the consequences of possible land disposal as leading to an increased human presence in the area, adding to existing pressures on other resources that may pose a higher threat to the success of ecological restoration efforts.

Many stakeholders may view Alternative C as a type of a middle ground; addressing a wide array of resource management issues and concerns, promoting multiple-use on a large-scale level, while avoiding many management options that might be viewed as extreme by one or more interest groups. This is not to characterize Alternative C as representing any type of a consensus, but rather as an alternative that offers many stakeholders something that they favor or can support.

**Conclusion.** Alternative C would increase regional population by 190 to 210 residents during restoration. The gains and corresponding benefits on local housing markets would be concentrated around Ely. Indirect benefits from long-term commodity use, stewardship contracting, and expanded options for possible land disposal would provide minor, long-term social benefits. The management emphasis for Alternative C may hold less appeal to stakeholders desiring stronger resource protection, sportsmen, and those favoring commercial uses of woodland and native plant products than to interests promoting motorized recreation.



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### Alternative D

**Population and Demographics.** Direct population effects of Alternative D would be similar to those described for Alternative A; long-term population declines in White Pine County, a stable or declining population in the eastern portion of Nye County, and limited growth in Lincoln County absent development of the Lincoln County Land Act.

No direct population effects would occur on any of the three Indian Reservations under Alternative D.

**Housing.** Alternative D would have little or no direct or indirect impacts on local housing conditions or markets.

**Social Values and Attitudes Regarding Public Land Management.** The effect of Alternative D in terms of social values and attitudes is in large measure the counter-point to Alternative C. Alternative D carries forward several elements of Alternative A, but is dramatically different with respect to constraints on and levels of resource use. Hence, many stakeholders may view this alternative as non-responsive to their concerns about the impacts of future management on their economic and social well-being. Among the few discrete impacts associated with Alternative D would be opposition by many residents and local government officials to the no net loss of public lands provision and the elimination of livestock grazing that would be viewed as constraining future economic and community development. Those same provisions may be supported in principle by environmental advocacy interests, or possibly seen as restricting the potential for land exchanges and other actions involving lands outside the District to achieve more desired environmental protection and management goals.

**Conclusion.** Alternative D would have little impact on regional population or housing markets, as compared to Alternative A. Alternative D carries forward several elements of Alternative A, but eliminates livestock grazing and places additional constraints on possible land disposal, mineral entry, and energy development that are viewed by residents as imperative to community and economic viability. Consequently, this alternative would hold relatively less appeal for area residents and local government officials than for those stakeholders whose specific areas of concern serve as the foundation for this alternative.

### Alternative E

**Population and Demographics.** Under Alternative E, the combination of \$10 million in annual funding of ecological restoration activities and the implementation of stewardship contracting would result in population gains larger than the 510 to 560 residents identified under Alternative B. The magnitudes and timing of the incremental gains generally would correspond to the employment effects associated with such contracting, which are presently unknown. Other population and demographic effects in the District, including effects on the three American Indian reservations and the effects associated with possible land disposal and improving ecological health, would be comparable to those described for Alternative B.



**Housing.** Under Alternative E, the impacts on local housing markets and conditions, including indirect effects associated with potential future residential development on disposed lands, would be similar to those described for Alternative B.

**Social Values and Attitudes Regarding Public Land Management.** Alternative E responds to a broadly held perspective that ecological health current conditions and trends within the District are deteriorating and that commitment of substantial resources are necessary to arrest the rate of decline, begin restoration, and to achieve properly functioning conditions. While many stakeholders would view favorably the increased funding levels and accelerated process of assessment and adaptive management response, concerns regarding the effectiveness of the approach and lengthy period required for implementation may foster concerns among various stakeholders about the need for more immediate or short-term actions. For example, ranchers would oppose the reductions in livestock grazing privileges associated with the temporary closure for treatment, but who support the possible allocation of additional post-treatment forage to grazing would see the short-term impacts as detrimental to their own sense of social and economic well-being as well as that of their neighbors, and their collective descendants.

At the same time, many residents of the area would value the added emphasis directed towards fuels management and wildfire risk reduction included in this alternative. As that effort is implemented, ranchers, home and business owners of properties closest to the urban/rural interface would sense feelings of relief. Many residents and non-resident familiar with the area also may value the expanded range of woodland and vegetation products available for personal use.

Local and Tribal government officials interested in promoting economic development initiatives may support the designation of areas for possible disposal, though some still would consider it insufficient in quantity and not well sited to meet future needs.

Stakeholders interested in ecological restoration and resource protection, as well as some of those interested in increased opportunities for off-highway vehicle use, would experience some degree of dissatisfaction with this alternative because it does not include the scale of management response they desire. For example, some groups and individuals interested in environmental restoration would like to see a complete and immediate cessation of grazing, more restrictions on off-highway vehicle travel, and the complete closure of more areas to all off-highway vehicle use. At the same time, individual off-highway vehicle enthusiasts and organizations may have preferred maintaining more than 1.0 million acres to open use and fewer travel restrictions limiting use to designated roads and trails.

Changes in the permitting of outfitters and guides under Alternative E may cause concerns among both the outfitters and guides and those who are used to a guided hunting experience but with more flexibility in the choice of outfitters and guides. Some individuals and groups may view the permitting procedures as favoring or benefiting established interests and limiting entry of new operators into this industry. Others may view these procedures as conflicting with the state's role in regulating hunting and the outfitting and guiding industry. The differences in viewpoints will resonate with local officials, some of whom may see it as enhancing the industry and its economic contributions to the regions, others who have a stronger free-market orientation.



Groups and individuals interested in resource protection would likely be skeptical or opposed to the emphasis on commercial activities, the expansion of recreation uses, particularly motorcycle and organized truck events, and the expanded designations of lands suitable for possible disposal, particularly those areas seen as having high recreation potential and other resource values. Others would see the consequences of possible land disposal as leading to an increased human presence in the area, adding to existing pressures on other resources that may pose a higher threat to the success of ecological restoration efforts.

Many stakeholders may view Alternative E as a type of a middle ground; addressing a wide array of resource management issues and concerns and promoting multiple-use on a large-scale level.

**Conclusion.** Alternative E would result in minor regional population increases of 510 to 560 residents during restoration, with corresponding long-term impacts on local housing markets. The gains would be relatively more concentrated around Ely. Additional social benefits may be realized from stewardship contracting, the fuels management/wildland fire risk reduction, and potential for developed recreation associated with possible land disposal. This alternative may hold relatively less appeal for those desiring maximum emphasis on resource protection and rangeland health restoration.

### *RMP Management Focus*

*The restoration and maintenance of healthy ecological systems within watersheds is a primary focus for the future management of the Ely District. Healthy ecological systems are geographically diverse and change over time. They are compatible with soil potential and are resilient to disturbance.*

*Resources and resource uses will be managed to restore or maintain ecological health. Certain resource management changes and active treatments may need to be implemented, in portions of watersheds, to accomplish this objective. Adaptive management will be pursued to avoid deteriorating conditions favoring invasive plants and catastrophic fires. Any projects will be implemented so as to result in a mosaic of vegetation within a watershed.*

*In the long term, natural disturbance (such as drought or fire) will occur and fewer treatments will be needed to maintain ecological health. The result will be a variety of vegetation phases within a watershed, which will provide diverse, healthy conditions for future generations.*



**4.25 American Indian Issues**

During the scoping process, several concerns were expressed by American Indian groups residing in or adjacent to the Ely District. Foremost was the continuation of pinyon pine nut harvesting for personal and commercial use, followed closely by continued access to harvesting areas and places of spiritual or cultural importance, land disposals, and the limitation on outfitter and guide permits and its effect on those tribes that offer guide services. Pinyon pine nut harvesting by American Indian groups for personal and commercial use, as well as access to places of spiritual or cultural importance, would continue under all of the alternatives. For a discussion on land disposals and the effect on the social and economic conditions of American Indian groups, the reader is referred to Section 4.24, Social Conditions. Changes in the permitting of outfitters and guides proposed under Alternatives B and E would affect those tribes that offer guide services; however, it is unknown at this time the level of impact these changes would have on their economic livelihood.







## 4.26 Environmental Justice

### Impact Issues

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations," requires each agency to identify and address disproportionately high and adverse effects on human health or environmental effects of its activities on minority and low-income populations.

### Assumptions for Analysis

None.

### Interactions with Other Programs

Management of other resources has the potential to cause environmental justice issues. Thus, other management direction was examined to identify areas of concern.

**Goal – No program-specific goals have been identified for environmental justice.**

### Alternative A

American Indians in the District have subsistence use (e.g., pinyon nut harvesting) and cultural ties to public lands in the District. Alternative A would maintain those current ties, inter-governmental coordination efforts, programs to protect important cultural values, and provide for continued access to places of spiritual and cultural importance and vegetation products.

Several areas of geographic interest were identified through interviews and meetings with American Indian tribes and their members. If a land use decision was proposed in an area of geographic interest to the tribes, the BLM would take into account any concern raised by the tribes and work with them to address those concerns.

**Conclusion.** No disproportionate adverse impacts to low-income populations were identified in conjunction with the resource programs, objectives, or management direction associated with Alternative A.

### Alternative B

Environmental justice issues would be the same as described for Alternative A.

**Conclusion.** No disproportionate adverse impacts to low-income populations were identified in conjunction with the resource programs, objectives, or management direction associated with Alternative B.



## 4.0 ENVIRONMENTAL CONSEQUENCES

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### Alternative C

Environmental justice issues would be the same as described for Alternative A.

**Conclusion.** No disproportionate adverse impacts to low-income populations were identified in conjunction with the resource programs, objectives, or management direction associated with Alternative C.

### Alternative D

Environmental justice issues would be the same as described for Alternative A.

**Conclusion.** No disproportionate adverse impacts to low-income populations were identified in conjunction with the resource programs, objectives, or management direction associated with Alternative D.

### Alternative E

Environmental justice issues would be the same as described for Alternative A, except that American Indian Tribes would be consulted prior to designation of areas for commercial harvesting of pinyon pine nuts.

**Conclusion.** No disproportionate adverse impacts to low-income populations were identified in conjunction with the resource programs, objectives, or management direction associated with Alternative E.



## 4.27 Health and Safety

### Impact Issues

It is expected that the health and safety management program within the Ely District potentially would be minimally affected by actions within other resource management programs except as noted below. Remediation of contaminated and hazardous sites is necessary for compliance with applicable federal and state rules and regulations governing the remediation of such sites.

### Assumptions for Analysis

None.

### Interactions with Other Programs

The health and safety management program of the Ely District would be affected by actions of the other resource management programs.

**Goal – The goal of the Health and Safety program is to ensure that management decisions are protective of life and property.**

### Alternative A

**Impacts from Health and Safety Management Direction.** Activities under this alternative would be conducted in accordance with applicable regulations and BLM policy with regard to health and safety and protection of personal property. All programs managed by the Ely District would operate under these basic rules and procedures. More stringent procedures could be instituted by the Ely Field Office for certain activities on a case-by-case basis, although none are proposed for this alternative. As a result, there would be no program-specific impacts for health and safety under this alternative.

**Impacts from Other Programs.** Minimal effects to health and safety have been identified as a result of management activities associated with other resource management programs.

*Vegetation/Fire Management.* Fuel supplies would continue to increase, leading to increased wildfire risk. Risks are primarily related to personal injury and physical destruction of property associated with wildfires. Although concern was raised during public scoping regarding emission of radionuclides during wildfires, there is no evidence that this would occur at a level constituting a health risk (see Section 4.2).

**Conclusion.** There would be a slight increase of risk to public health and safety because of an increased wildfire risk.



## 4.0 ENVIRONMENTAL CONSEQUENCES

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### Alternative B

**Impacts from Health and Safety Management Direction.** Impacts are the same as Alternative A.

**Impacts from Other Programs.** Minimal effects to health and safety have been identified as a result of management activities associated with other resource management programs.

*Vegetation/Fire Management.* Vegetation treatments, including fuel reduction in wildland urban interface areas, would substantially reduce the quantities of large fuels in “overmature” sagebrush and woodland communities, thereby reducing the long-term risk of personal injury and destruction of property associated with wildfires. The revised Fire Management Plan facilitates prompt fire response and improves guidance and direction for fire use in each Fire Management Unit.

**Conclusion.** There would be a decrease of risk to public health and safety because of decreased wildfire risk.

### Alternative C

**Impacts from Health and Safety Management Direction.** Impacts are the same as Alternative A.

**Impacts from Other Programs.** Minimal effects to health and safety have been identified as a result of management activities associated with other resource management programs.

*Vegetation/Fire Management.* Vegetation treatments focused on removal of large fuels would be less extensive than in Alternative B. The continued accumulation of fuels in untreated areas coupled with wildfire suppression of this alternative would ultimately lead to major wildfire risks and the associated risks of personal injuries and destruction of personal property.

**Conclusion.** There would be an increase of risk to public health and safety because of increased wildfire risk.

### Alternative D

**Impacts from Health and Safety Management Direction.** Impacts are the same as Alternative A.

**Impacts from Other Programs.** Minimal effects to health and safety have been identified as a result of management activities associated with other resource management programs.

*Vegetation/Fire Management.* This alternative would combine minimal fire suppression efforts with very limited vegetation treatments. Thus, major large-scale wildfire events and increased fire risk and personal injuries and destruction of property associated with wildfires would be expected over the long term and may occur during the short term.



**Conclusion.** There would be a great increase of risk to public safety because of the increased wildfire risk and the potential for large destructive fires.

### **Alternative E**

**Impacts from Health and Safety Management Direction.** No specific management direction has been identified for health and safety. As a result, there would be no program-specific impacts for health and safety under this alternative.

**Impacts from Other Programs.** Minimal effects to health and safety have been identified as a result of management activities associated with other resource management programs.

*Vegetation/Fire Management.* Vegetation treatments, including fuel reduction in wildland urban interface areas, and fire management plans of this alternative would substantially reduce the long-term risk of large-scale wildfires and the risk of personal injuries and destruction of personal property associated with wildfires. The revised Fire Management Plan facilitates prompt fire response and improves guidance and direction for fire use in each Fire Management Unit.

**Conclusion.** There would be a decrease of risk to public health and safety because of the decreased wildfire risk.







## 4.28 Cumulative Impacts

### 4.28.1 Introduction

Cumulative impacts are those effects on the environment that result from the incremental impacts of the management direction contained in the RMP when added to the effects of other past, present, and reasonably foreseeable future actions, regardless of what agency (federal, Tribal, state, or local) or private entity undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 Code of Federal Regulations 1508.7). This analysis focuses on the cumulative impacts of the Proposed Action for the Ely RMP/EIS and other actions both within and outside of the District. A qualitative description of the differences in cumulative impacts between the Proposed Action and other alternatives (Alternative A through Alternative D) also is included.

Nevada BLM Instruction Memo NV-90-435 specifies that impacts must first be identified for the proposed action (i.e., the RMP) before cumulative impacts with other actions can occur. According to the BLM's "Guidelines for Assessing and Documenting Cumulative Impacts" 1994 handbook, cumulative impact analysis should be focused on those issues identified during scoping that are of major importance, in this case the cumulative impacts of new management direction.

#### 4.28.1.1 Assumptions for Cumulative Impact Analysis

- Based on an assumed 5 acre-feet per acre per year for areas currently cultivated in the Ely District, there would be an ongoing water demand of 320,000 acre-feet per year for agricultural development.
- Based on an assumed 10 gallons per animal unit per day for livestock and wild horses in the Ely District, there would be an ongoing water demand of 550 acre-feet per year for livestock grazing.
- Based on an assumed 160-foot-wide right-of-way, the Falcon to Gonder transmission line is expected to produce a surface disturbance of approximately 1,200 acres.
- Residential development is assumed to have a water demand of 1 acre-foot per acre of development per year.
- Based on an assumed 10-foot-wide increase in width, the paving of Kane Springs Road would result in a new surface disturbance of approximately 50 acres.
- Based on an assumed 80-mile-long, 100-foot-wide construction right-of-way, the road from Caliente to Mesquite would result in a new surface disturbance of approximately 970 acres.
- Based on an assumed 1,400-acre site; a 12-mile-long, 75-foot-wide water pipeline right-of-way; a 2-mile-long, 100-foot-wide rail spur right-of-way, and a 20-mile-long, 160-foot-wide transmission line right-of-way, new surface disturbance associated with the White Pine Energy Station is estimated at 1,920 acres.



## 4.0 ENVIRONMENTAL CONSEQUENCES

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- Based on an assumed 383-mile-long, 200-foot-wide right-of-way, the Southwest Intertie Project is expected to result in a new surface disturbance of approximately 9,300 acres.
- Up to 1,600 megawatts of wind energy capacity would be developed on the Ely District, and wind farms and ancillary facilities would have approximately 5,000 acres of temporary disturbance and 2,700 acres of permanent disturbance.
- Based on an assumed 100-mile-long, 200-foot-wide right-of-way within the Ely District, the railroad branch line from Caliente, Nevada, to the Yucca Mountain Repository is expected to result in approximately 2,400 acres of new surface disturbance.

### 4.28.1.2 Timeframe for Analysis

The timeframe for this cumulative impact analysis encompasses past and present activities in the Ely District, including historic mining which may date back more than 100 years, and future activities that may extend 20 years into the future.

### 4.28.1.3 Past, Present, and Reasonably Foreseeable Future Actions

Interrelated projects are defined for this EIS as those activities that could interact with the Ely RMP in a manner that would result in cumulative impacts. For ease of presentation, interrelated projects and natural processes have been grouped as past, present, and reasonably foreseeable future actions that may interact with the management direction contained in the RMP/EIS. The potentially interrelated projects are listed and described below. **Table 4.28-1** quantifies four important characteristics of each project that are relevant to cumulative impacts. These characteristics were selected to describe the interrelated project because they address the potential physical, biological, and socioeconomic impacts of each project. It also allows the combined impacts of interrelated projects to be totaled. The interrelated projects are shown in **Map 4.28-1**, and **Table 4.28-2** identifies the potential interactions among the interrelated projects and the resource programs. The geographic area for cumulative impacts is determined primarily by the locations of the interrelated projects and the interactions with potentially affected resource programs. The area for certain resources may be restricted to the actual disturbance areas of the interrelated projects (i.e., cultural resource sites), while others may range over a wider area within and beyond the District (i.e., air quality).

#### Past Actions

- **Atlanta Mining District** – The Atlanta Mining District was discovered in 1869 and included a historic underground and open pit gold and uranium mine located north of Pioche. Mining commenced in 1871 and continued intermittently until 1996 (Tschanz and Pampeyan 1970).
- **Mount Hamilton/White Pine Mining District** – The Hamilton or White Pine Mining District was located in 1865 and operations continued through the 1990s. This District experienced one of the largest mining rushes in U.S. history and produced silver, copper, lead, and zinc from underground and open pit mines located west of Ely in the White Pine Range (Hose et al. 1976).



**Table 4.28-1**  
**Impact Characteristics of Interrelated Projects and Natural Processes**

Interrelated Project	Air Emissions <sup>1</sup>	Surface Disturbance within the Ely District (acres)	Ongoing Water Demand within the Ely District (acre-feet/year)	Permanent Employment within the Ely District
<b>Past Actions</b>				
<b>Human Actions</b>				
• Atlanta mining district	Not Applicable	500	Not Applicable	Not Applicable
• Mount Hamilton/ White Pine mining district	Not Applicable	400	Not Applicable	Not Applicable
• Pioche mining district	Not Applicable	700	Not Applicable	Not Applicable
• Robinson mining district	Not Applicable	5,400	Not Applicable	Not Applicable
• Tempiute mining district	Not Applicable	200	Not Applicable	Not Applicable
• Nevada Test Site	Not Applicable	No Effect	Not Applicable	Not Applicable
• Road and railroad development	Not Applicable	28,100	Not Applicable	Not Applicable
• Agricultural development	Not Applicable	See Present Actions	Not Applicable	Not Applicable
• Livestock grazing	Not Applicable	(Minimal over 11.4 million acres open to grazing)	Not Applicable	Not Applicable
• Designation of critical habitat for threatened and endangered species	Not Applicable	Not Applicable	Not Applicable	Not Applicable
<b>Natural Processes</b>				
• Wildland fire	Not Applicable	400,000 (over 20 years)	Not Applicable	Not Applicable
• Spread of noxious/ invasive weeds	Not Applicable	168,000	Not Applicable	Not Applicable
<b>Subtotal</b>	Not Applicable	603,300	Not Applicable	Not Applicable



Table 4.28-1 (Continued)

Interrelated Project	Air Emissions <sup>1</sup>	Surface Disturbance within the Ely District (acres)	Ongoing Water Demand within the Ely District (acre-feet/year)	Permanent Employment within the Ely District
<b>Present Actions</b>				
<b>Human Actions</b>				
• Bald Mountain mining district	PM <sub>10</sub> , oxides of nitrogen, carbon monoxide, and sulfur dioxide within National Ambient Air Quality Standards; process emissions less than 100 tons per year	3,900	2,000	100
• Reopening the Robinson Mine	Would meet New Source Performance Standards	No new area	5,700	370
• Reclamation of the McGill tailings	Fugitive dust	3,500	10,000	1
• Reid Gardner Power Plant (Clark County)	Coal-fired; PM <sub>10</sub> , oxides of nitrogen, carbon monoxide, and sulfur dioxide emissions greater than 100 tons per year; Prevention of Significant Deterioration source within National Ambient Air Quality Standards	No Effect	No Effect	No Effect
• Department of Defense activities	No Effect	(Minimal over 691,000 acres of Nevada Test and Training Range within the planning area)	No Effect	No Effect
• Agricultural development	No Effect	64,000	320,000 (assuming 5 acre-feet/acre/year)	320 (split with livestock grazing)
• Livestock grazing	No Effect	(Minimal over 11.2 million acres open to grazing)	550 (assuming 10 gallon/animal unit/day for livestock and wild horses)	320 (split with agricultural development)
• APHIS predator control	No Effect	No Effect	No Effect	5
• Falcon to Gonder 345-kV transmission line	No Effect	1,200 (assuming a 160-foot-wide right-of-way)	No Effect	No Effect



Table 4.28-1 (Continued)

Interrelated Project	Air Emissions <sup>1</sup>	Surface Disturbance within the Ely District (acres)	Ongoing Water Demand within the Ely District (acre-feet/year)	Permanent Employment within the Ely District
• Off-highway vehicle recreation use	No Effect	(Entire District open except wilderness and wilderness study areas)	No Effect	No Effect
<b>Natural Processes</b>				
• Wildland fire	Short term and seasonal	See Future Actions	No Effect	No Effect
• Drought	No Effect	No Effect	(Would decrease supply)	No Effect
<b>Subtotal</b>	Not Applicable	<b>72,600</b>	<b>338,250</b>	<b>1,116</b>
<b>Reasonably Foreseeable Future Actions (RFFAs)</b>				
<b>Human Actions</b>				
• Lincoln County Land Act development	No Effect	13,500	13,500	Unknown
• Lincoln County Conservation, Recreation, and Development Act	No Effect	Up to approximately 110,000	Unknown	Unknown
• Transfer of lands to American Indian Tribes	No Effect	Location and area to be determined by Congress	Unknown	Unknown
• Water development in Lincoln County and White Pine County	No Effect	3,000 (200 wells at 1 acres per well, and 300 miles of 75-foot-wide pipeline right-of-way)	Unknown	20
• Coyote Springs residential development	No Effect	20,000	20,000	Unknown
• Paving Kane Springs Road	No Effect	Approximately 50 acres assuming 10 feet of new disturbance	No Effect	No Effect
• Road from Caliente to Mesquite	No Effect	Approximately 970 acres assuming a 80-mile-long, 100-foot-wide construction right-of-way	No Effect	No Effect
• Toquop Energy Project	Gas-fired; would meet New Source Performance Standards	500	7,000	30
• White Pine Energy	Would meet New Source	Approximately 1,920	26,000	150



Table 4.28-1 (Continued)

Interrelated Project	Air Emissions <sup>1</sup> Performance Standards	Surface Disturbance within the Ely District (acres)	Ongoing Water Demand within the Ely District (acre-feet/year)	Permanent Employment within the Ely District
Station	Performance Standards	(assumes 1,400 acres for site, 12 miles of water pipeline at 75 feet wide, 2 miles of rail spur at 100 feet wide, and 20 miles of transmission line at 160 feet wide)		
• Southwest Intertie Project	No Effect	Approximately 9,300 acres assuming a 383-mile-long, 200-foot-wide right-of-way	No Effect	No Effect
• Wind energy development	No Effect	2,700 permanent	No Effect	20
• Expansion of the Bald Mountain Mine (Mooney Basin)	Would meet New Source Performance Standards	240	1,100	100
• Placer Dome Land Sale	No Effect	14,770	Unknown	Unknown
• Expansion of the Panaca pozzolana mine	No Effect	200	No Effect	15
• Department of Defense activities	No Effect	(Minimal over 691,000 acres of Nevada Test and Training Range within the District)	No Effect	No Effect
• Yucca Mountain Project	No Effect	No Effect	No Effect	No Effect
• Department of Energy rail line withdrawal application	No Effect	Approximately 2,400 acres assuming a 100-mile-long, 200-foot-wide right-of-way within the District	No Effect	10
• Bassett Lake dam rebuild and expansion	No Effect	Unknown	No Effect (no new water use not already prior appropriated)	No Effect
• Cave Lake dam rebuild	No Effect	No Effect	No Effect	No Effect



Table 4.28-1 (Continued)

Interrelated Project	Air Emissions <sup>1</sup>	Surface Disturbance within the Ely District (acres)	Ongoing Water Demand within the Ely District (acre-feet/year)	Permanent Employment within the Ely District
• Comins Lake expansion	No Effect	Lake surface would expand approximately 600 acres	No Effect (No new water use not already prior appropriated)	No Effect
• APHIS predator control	No Effect	No Effect	No Effect	5
• Habitat conservation plans for threatened and endangered species	No Effect	Could restrict surface disturbance in certain areas	No Effect	No Effect
• Sage grouse conservation plans	No Effect	Vegetation would be treated to improve sage grouse habitat but not possible to quantify	No Effect	No Effect
• Increased off-highway vehicle use from population growth in Clark County	No Effect	(Limited to existing roads and trails, and 734,000 acres emphasized for use but not all disturbed)	No Effect	No Effect
<b>Natural Processes</b>				
• Wildland fire	Short term and seasonal	60,000	No Effect	No Effect
• Drought	No Effect	No Effect	(Would decrease supply)	No Effect
• Expansion of pinyon and juniper trees	No Effect	No Effect	(Increased transpiration)	No Effect
• Spread of forest diseases	No Effect	No Effect	No Effect	No Effect
• Spread of noxious/invasive weeds	No Effect	No Effect	No Effect	No Effect
• Spread of West Nile virus	No Effect	No Effect	No Effect	No Effect
<b>Subtotal</b>	<b>Not Applicable</b>	<b>780,750</b>	<b>67,600</b>	<b>350</b>
<b>TOTAL</b>	<b>Not Applicable</b>	<b>1,456,650</b>	<b>404,850</b>	<b>1,466</b>

Note: All quantification is approximate.

<sup>1</sup>Air emissions from mobile sources and those that would not extend beyond 2 miles would not have any significant cumulative impact.



Table 4.28-2  
Interactions Between Resources and Interrelated Projects

Interrelated Project	Air Quality	Water Resources	Soils	Vegetation	Fisheries	Wildlife	Special Status Plant Species	Special Status Aquatic Species	Special Status Wildlife Species	Wild Horses	Cultural Resources	Paleontological Resources	Visual	Lands and Realty	Renewable Energy	Travel Management/Off-highway Vehicle Use	Recreation	Livestock Grazing	Woodland and Native Plant Products	Mineral Extraction	Watershed Management	Fire Management	Noxious and Invasive Weed Management	Special Designations	Economic and Social Conditions	American Indian Issues	Health and Safety
	Past Actions																										
	Human Actions																										
• Atlanta mining district									X		X	X									X			X	X	X	
• Mount Hamilton/ White Pine mining district									X		X	X									X		X	X	X	X	
• Pioche mining district								X			X	X									X		X	X	X	X	
• Robinson mining district			X	X		X			X		X	X							X	X	X		X	X	X	X	
• Tempiute mining district											X	X								X	X			X	X	X	
• Nevada Test Site											X	X		X	X						X				X	X	
• Road and railroad development			X	X	X	X	X		X		X	X		X	X				X	X		X		X	X	X	
• Agricultural development					X	X	X	X	X		X			X								X		X	X	X	
• Livestock grazing			X	X	X	X	X	X	X	X	X									X		X	X	X	X	X	







Table 4.28-2 (Continued)

Interrelated Project	Air Quality	Water Resources	Soils	Vegetation	Fisheries	Wildlife	Special Status Plant Species	Special Status Aquatic Species	Special Status Wildlife Species	Wild Horses	Cultural Resources	Paleontological Resources	Visual	Lands and Realty	Renewable Energy	Travel Management/Off-highway Vehicle Use	Recreation	Livestock Grazing	Woodland and Native Plant Products	Mineral Extraction	Watershed Management	Fire Management	Noxious and Invasive Weed Management	Special Designations	Economic and Social Conditions	American Indian Issues	Health and Safety
• Agricultural development		X	X	X	X	X	X	X	X		X			X					X		X			X			
• Livestock grazing		X	X	X	X	X	X	X	X	X	X								X	X		X			X		
• APHIS predator control						X			X	X																	
• Falcon to Gonder 345-kilovolt transmission line				X							X	X	X	X	X								X	X	X	X	
• Off-highway vehicle recreation use	X		X	X	X	X		X	X	X	X	X		X		X			X		X	X	X	X	X	X	
<b>Natural Processes</b>																											
• Wildland fire	X		X	X	X	X	X	X	X	X	X		X	X					X	X		X	X				X
• Drought	X		X	X	X	X		X	X	X				X	X				X	X		X	X				X
<b>Reasonably Foreseeable Future Actions</b>																											
<b>Human Actions</b>																											
• Lincoln County Land Act development		X	X	X	X	X	X	X	X				X	X					X						X		



Table 4.28-2 (Continued)

Interrelated Project	Air Quality	Water Resources	Soils	Vegetation	Fisheries	Wildlife	Special Status Plant Species	Special Status Aquatic Species	Special Status Wildlife Species	Wild Horses	Cultural Resources	Paleontological Resources	Visual	Lands and Realty	Renewable Energy	Travel Management/Off-highway Vehicle Use	Recreation	Livestock Grazing	Woodland and Native Plant Products	Mineral Extraction	Watershed Management	Fire Management	Noxious and Invasive Weed Management	Special Designations	Economic and Social Conditions	American Indian Issues	Health and Safety
• Lincoln County Conservation, Recreation, and Development Act		X	X	X	X	X	X	X	X	X	X	X	X	X	X				X		X	X	X	X	X	X	
• Transfer of lands to American Indian Tribes											X	X		X					X		X	X			X	X	
• Water development in Lincoln County and White Pine County		X	X	X	X	X	X	X	X		X	X		X					X		X	X	X	X	X	X	
• Coyote Springs residential development		X	X	X	X	X					X	X		X								X	X		X	X	
• Paving Kane Springs Road											X			X		X						X	X	X	X	X	
• Road from Caliente to Mesquite			X	X	X						X	X		X		X							X	X	X	X	
• Toquop Energy Project	X	X	X	X		X		X			X	X		X	X								X	X	X	X	
• White Pine Energy Station	X	X	X	X		X		X	X		X	X		X	X				X				X	X	X	X	
• Southwest Intertie Project				X			X	X	X		X	X	X	X	X								X	X	X	X	



Table 4.28-2 (Continued)

Interrelated Project	Air Quality	Water Resources	Soils	Vegetation	Fisheries	Wildlife	Special Status Plant Species	Special Status Aquatic Species	Special Status Wildlife Species	Wild Horses	Cultural Resources	Paleontological Resources	Visual	Lands and Realty	Renewable Energy	Travel Management/Off-highway Vehicle Use	Recreation	Livestock Grazing	Woodland and Native Plant Products	Mineral Extraction	Watershed Management	Fire Management	Noxious and Invasive Weed Management	Special Designations	Economic and Social Conditions	American Indian Issues	Health and Safety
• Wind energy development			X	X		X	X		X		X	X	X	X	X					X		X		X	X	X	
• Expansion of the Bald Mountain Mine (Mooney Basin)	X	X	X	X		X			X		X	X	X	X						X	X		X		X	X	
• Placer Dome Land Sale														X							X						
• Expansion of the Panaca pozzolana mine								X			X	X		X							X			X	X	X	
• Department of Defense activities														X										X	X	X	
• Yucca Mountain Project														X		X								X	X	X	
• Department of Energy rail line withdrawal application		X	X	X	X	X	X	X	X	X	X	X	X	X					X			X		X	X	X	
• Bassett Lake dam rebuild and expansion					X		X											X					X	X	X	X	
• Cave Lake dam rebuild																										X	



Table 4.28-2 (Continued)

Interrelated Project	Air Quality	Water Resources	Soils	Vegetation	Fisheries	Wildlife	Special Status Plant Species	Special Status Aquatic Species	Special Status Wildlife Species	Wild Horses	Cultural Resources	Paleontological Resources	Visual	Lands and Realty	Renewable Energy	Travel Management/Off-highway Vehicle Use	Recreation	Livestock Grazing	Woodland and Native Plant Products	Mineral Extraction	Watershed Management	Fire Management	Noxious and Invasive Weed Management	Special Designations	Economic and Social Conditions	American Indian Issues	Health and Safety
					X		X							X			X		X						X		
						X			X	X								X	X								
									X	X								X	X								
				X					X	X									X	X							
											X								X	X							
			X		X		X	X						X		X	X	X							X		
			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
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Table 4.28-2 (Continued)

<div>Interrelated Project</div> <div><ul style="list-style-type: none"><li>• Spread of noxious/invasive weeds</li><li>• Spread of West Nile virus</li><li>• White pine blister rust</li></ul></div>	Air Quality			
	Water Resources			
	Soils	X		
	Vegetation	X		X
	Fisheries			
	Wildlife	X	X	
	Special Status Plant Species			
	Special Status Aquatic Species			
	Special Status Wildlife Species	X	X	
	Wild Horses	X	X	
	Cultural Resources			
	Paleontological Resources			
	Visual			
	Lands and Realty	X		
	Renewable Energy			
	Travel Management/Off-highway Vehicle Use			
	Recreation			
	Livestock Grazing	X		
	Woodland and Native Plant Products	X		
	Mineral Extraction			
	Watershed Management	X		
	Fire Management	X		
	Noxious and Invasive Weed Management	X		
	Special Designations			
	Economic and Social Conditions	X		
	American Indian Issues			
	Health and Safety		X	



- Pioche/Caselton Mining District – The Pioche/Caselton Mining District was discovered in 1863; production began in 1869 and continued until approximately 1960. Production from underground mines in the District, which was located in the Pioche Hills to the west of Pioche, included silver, zinc, gold, copper, and lead (Tschanz and Pampeyan 1970).
- Robinson Mining District – The Robinson Mining District, which is one of the oldest and largest mining districts in the state, is located just west of Ely and dates back to 1867. Silver was the first commodity mined in the district, followed by gold. Copper mining began in 1908 and was active until approximately 1999 (Hose et al. 1976; BLM 1994).
- Tempiute Mining District – The Tempiute Mining District began as a silver district and was developed from 1869 to 1883. Tungsten was discovered in 1916 and was ultimately mined from the 1930s to 1957 and again from 1977 to 1982. While currently inactive, the district has produced copper, lead, and zinc, in addition to silver and tungsten (Tschanz and Pampeyan 1970; Cox and Singer 1992).
- Nevada Test Site – This 1,375-square-mile area was originally established in the early 1950s as the Atomic Energy Commission's on-continent nuclear weapons proving ground. It lies contiguous with the Nevada Test and Training Range. A moratorium on nuclear weapons testing was implemented in 1992 and since that time, the site, which is located 65 miles north of Las Vegas, has diversified into many other programs such as hazardous chemical spill testing, environmental technology studies, conventional weapons testing, waste management, and emergency response training (USDOE 2004).
- Road and railroad development – Roads and railroads built in the Ely District prior to the 1990s largely accommodated mining operations and supplied local communities. The Nevada Northern Railway to Wendover line and the Union Pacific line from Caliente to Las Vegas are two historic rail lines located within the Ely District.
- Agricultural development – Historic agricultural development in the District was generally associated with livestock and included irrigated hay pastures.
- Livestock grazing – Livestock grazing operations in the District developed during the mid- to late-1800s. Historic stocking rates were higher than present.
- Critical habitat has been designated for threatened and endangered species within the Ely District. The most extensive designation involved the desert tortoise habitat in the Mojave Desert region of the southeastern part of the District. In the 2000 Desert Tortoise Amendment (see Appendix I), 212,500 acres were designated as three ACECs for the protection of critical habitat.
- Wildland fire – Over the past 20 years, wildland fire has burned approximately 400,000 acres within the Ely District. The area burned has varied greatly from year to year.



## 4.0 ENVIRONMENTAL CONSEQUENCES

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- Spread of noxious/invasive weeds – Noxious and invasive weeds have been spreading on the Ely District to the point that approximately 168,000 acres managed by the Ely Field Office are now infested. Invasive annual grasses such as cheatgrass and red brome have become the primary problem.

### Present Actions

- Bald Mountain Mining District – The Bald Mountain Mining District is located in White Pine County approximately 70 miles northwest of Ely, Nevada. The district dates back to 1869 with open pit gold mining and processing beginning in the 1980s (BLM 1995). Current operations are anticipated to continue through 2010 and beyond.
- Reopening the Robinson Mine – Quadra Mining Ltd. has purchased the Robinson Mine facilities east of Ely and resumed operations in the fourth quarter of 2004. Surface disturbance areas are expected to remain as identified in the 1994 EIS (BLM 1994).
- Reclamation of the McGill tailings – The McGill tailings were generated through operations associated with a historic copper smelter and gravity separator located north of Ely. The smelter processed ore from 1908 to 1980, had 1,400 employees at its peak, and an 8.5-mile-long water supply pipeline (Hose et al. 1976). The tailings disposal area is currently undergoing reclamation.
- Reid Gardner Power Plant – Reid Gardner is a 590-megawatt, coal-fired power plant that was constructed in the mid-1960s just south of Moapa, Nevada. It is owned and operated by Nevada Power Company. Coal is delivered to the plant site via rail.
- Department of Defense Activities – The Military has used and would like to continue using the Public lands in the Ely BLM District. A portion of the Ely District lands fall under the Desert, Reveille, and Gandy Military Operations Areas and several low-level Military Training Routes. The typical military uses are: overflights; fixed and rotary wing landing areas; Forward Air Refueling Points; electronic communication (fixed and mobile) and threat operations; Drop Zone operations (airdrops from 500 feet above ground level to 10,000 feet above ground level of equipment or personnel); no-drop visual-only convoy targets; and emergency access and response.
- Agricultural development – Approximately 63,800 acres are currently under agricultural production in the Ely District. This amount includes irrigated hay pastures, row crops, grain crops, and orchards (BLM geographic information system database 2004).
- Livestock grazing – Approximately 11.2 million acres are currently available for grazing in the Ely District. A total of approximately 535,487 animal unit months are permitted in the District, with approximately 206,707 animal unit months of use identified in 2002 (BLM geographic information system database 2004).
- Animal and Plant Health Inspection Service (APHIS) predator control – Wildlife Services (formerly known as Animal Damage Control), a program within the U.S. Department of Agriculture's Animal and



Plant Health Inspection Service, is tasked with controlling damage by wildlife. There are two U.S. Department of Agriculture Wildlife Services predator control programs currently in process in the Ely District. These include the Wilson Creek Range/Hunt Unit 231, which just began and involves eliminating coyotes, as necessary, to increase mule deer fawn recruitment in the area. The project is located in the southern portion of Shield Creek in Lincoln County and could last up to 3 years. The Shield Creek Range/Hunt Unit 222 Project/Horse-Cattle Camp Loop Project also is just beginning and is located in the northeast quadrant of Lincoln County. It is expected to continue through 2007 and involves selective hunting of older coyotes to improve mule deer fawn recruitment (Spencer 2004).

- Falcon to Gonder 345-kilovolt Transmission Line – A new 345-kilovolt transmission line has been constructed to connect the Falcon Substation (north of Dunphy and Battle Mountain, Nevada) to the Gonder Substation (north of Ely, Nevada). Reclamation is ongoing. Approximately 60 miles of the line lie within the Ely District (BLM 2001i [Falcon to Gonder EIS]).
- Off-highway vehicle recreation use – As large areas of BLM-managed land in Clark County are being closed to off-highway vehicle use due to measures taken to protect the desert tortoise and air quality, more recreation use has shifted to Lincoln and White Pine counties.
- Wildland fire – See Reasonably Foreseeable Future Actions.
- Drought – See Reasonably Foreseeable Future Actions.

#### **Reasonably Foreseeable Future Actions**

- Lincoln County Land Act development – As mandated by the Lincoln County Land Act of October 13, 2000, BLM disposed of 13,500 acres of public land located north and west of Mesquite, Nevada. The sold land would be used to expand the community of Mesquite, Nevada (BLM 2001b [Lincoln County Land Act Environmental Assessment]).
- Lincoln County Conservation, Recreation, and Development Act – The Lincoln County Conservation, Recreation, and Development Act was signed into law on November 30, 2004. The Act authorizes the sale of up to 90,000 acres of BLM-administered land in Lincoln County, with 10 percent of the revenues going to Lincoln County for economic development, 5 percent to the state for education, and 85 percent being retained by the federal government. The Act also designates approximately 770,000 acres of wilderness.
- Transfer of lands to American Indian Tribes – Proposals are being prepared by the Tribes for the transfer of public lands within the Ely District to American Indian tribes, including the Duckwater Shoshone Tribe, Ely Shoshone Tribe, and Moapa Band of Paiutes. The location and land area of any such transfers would be determined by Congress.
- Water development in Lincoln County and White Pine County – Groundwater development in Lincoln County and White Pine County may occur. A proposal by the Southern Nevada Water Authority is



## 4.0 ENVIRONMENTAL CONSEQUENCES

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currently being evaluated by the Ely Field Office in a separate EIS. It is anticipated that the water would be used in White Pine or Lincoln counties for industrial or residential development or would be transported to Clark County. Water development is regulated by the Nevada State Engineer and not the BLM.

- Coyote Springs residential development – This planned development of approximately 50,000 people would be located near the Clark and Lincoln County line on Highway 93. Approximately 20,000 acres are designated for the development (Hartmann 2004).
- Paving Kane Springs Road – This approximately 40-mile-long paving project, which would be located between Elgin, Nevada, and Highway 93 northwest of Moapa, would result in minimal land disturbance (slight widening of the existing roadway). The road lies on lands managed by both the BLM and Lincoln County (Hartmann 2004).
- Road from Caliente to Mesquite – This roadway would provide access to the Lincoln County Land Act area and to the Toquop Energy Project site. The road would involve new construction disturbance along an approximately 80-mile-long, 100-foot-wide construction right-of-way (Hartmann 2004).
- Toquop Energy Project – Toquop Energy, Incorporated is planning to construct and operate a 1,100-megawatt natural gas-fired water-cooled electric generating plant in southeastern Lincoln County. The anticipated in-service date is 2006. The project includes a 12.5-mile-long waterline, 1,300-foot-long electric utility line, a 2,400-foot-long, 20-inch-diameter gas pipeline, and a 14.4-mile-long access road (Toquop Energy 2004). Recent discussions have also indicated the potential for a coal-fired unit with fuel being delivered by rail; however, no formal proposal has been made to the BLM. Such a revision in the project description would require a supplemental or new EIS before project development could begin.
- White Pine Energy Station – A proposed coal-fired power plant between Cherry Creek and McGill, Nevada, is undergoing NEPA review. As part of the plan, the existing Nevada Northern Railroad would be used to transport coal to the site.
- Southwest Intertie Project – This project would involve construction, operation, and maintenance of a 540-mile-long 500-kilovolt transmission line through Idaho, Nevada, and Utah. Approximately 383 miles of this project would lie in the Ely District, including an east-west section between Ely and Delta, Utah. A right-of-way for this project was granted in the 1990s; however, it is currently unknown when and if the line would be constructed (BLM 2001i).
- Wind energy development – The potential for wind energy development exists within the Ely District. Based on Department of Energy evaluation of wind energy potential, rights-of-way for wind farms have been designated as part of this RMP (see Chapter 2.0). It has been assumed that three 50-megawatt wind farms would be developed during the next 20 years.



- Expansion of the Bald Mountain Mine – Placer Dome U.S. Inc. is planning an amendment to the Mooney Basin Plan of Operations. This mine operation was originally analyzed as part of the Bald Mountain Mine EIS completed in 1995. This amendment would involve an approximately 240-acre increase in the size of the existing mine area and enable Placer Dome to continue mining and gold production for an additional 6 to 8 years.
- Placer Dome Land Sale – The proposed Northern Nevada Rural Economic Development and Land Consolidation Act of 2003 (H.R. 2869) may direct the BLM to sell approximately 14,770 acres of land located on Alligator Ridge and Bald Mountain in White Pine County to Placer Dome, Inc.
- Expansion of the Panaca pozzolana mine – This existing, small-scale mine could be expanded. Pozzolana is a finely divided volcanic ash mineral composed of silica and aluminum that reacts chemically with lime, in the presence of moisture and at ordinary temperature, to form a strong, slow-hardening cement.
- Department of Defense activities – Military operations are described above in the past actions section and are expected to continue through the next 20 years.
- Yucca Mountain operations – On July 9, 2002, the U.S. Senate cast the final legislative vote approving the development of a deep underground facility, or repository, at Yucca Mountain, Nevada, for storage of highly radioactive nuclear waste. The repository is anticipated to store waste for at least 10,000 years. The Yucca Mountain Project is currently focused on preparing an application to obtain a license from the U.S. Nuclear Regulatory Commission to construct the repository. No construction date has been set (Office of Civilian Radioactive Waste Management 2004).
- Department of Energy rail line withdrawal application – Approximately 308,600 acres in Clark, Esmeralda, Lincoln, and Nye counties would be withdrawn from surface entry and mining for a period of 20 years. During this period the land would be evaluated for potential construction, operation, and maintenance of a 307-mile-long branch rail line for the transportation of spent nuclear fuel and high-level radioactive waste to the proposed Yucca Mountain Repository. Approximately 100 miles of the proposed railroad corridor would be within the Ely District (The Office of Civilian Radioactive Waste Management 2004).
- Bassett Lake is a 77-acre reservoir located northwest of McGill, Nevada, on property owned by Kennecott Minerals Company. Discussions are underway among Kennecott, the Nevada Department of Wildlife, and White Pine County regarding the conversion of the lake from private to public ownership. It has been proposed that the dam creating the reservoir could be rebuilt and the pool size enlarged. Details on the project await resolution of ownership issues and a detailed engineering study.
- Cave Lake dam rebuild – The proposed project would repair the dam at the lake, probably between 2005 and 2007. No additional surface disturbance would be required, the lake would not increase in size, and fewer than 50 people are expected to be involved in construction (Richards 2004).



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- Comins Lake expansion – Comins Lake south of Ely provides a productive year-round recreational fishery. Nevada Department of Wildlife is proposing to increase the area of Comins Lake for recreation purposes, effectively doubling its size to about 1,000 acres. A recent study evaluated reinforcing the existing roadway (Highway 93) at the lake crossing to act as a dam. The project is expected to be implemented in 2007 to 2008 (Richards 2004).
- Animal and Plant Health Inspection Service predator control – No new projects have been identified for implementation. The Wilson Creek and Shield Creek predator control projects are expected to continue until about 2007 (Spencer 2004).
- Habitat conservation plans for threatened and endangered species – New habitat conservation plans could be developed for currently listed species. If additional species are listed as threatened or endangered, habitat conservation plans also would be developed for designated critical habitat within the Ely District. It is anticipated that if new listings become necessary, they would most likely involve species that are dependent on sagebrush for their habitat requirements.
- Sage grouse conservation plans – The downward trend of the greater sage-grouse throughout the West resulted in petitions for listing the bird range-wide and locally as federally threatened or endangered. On January 4, 2005, the Secretary of the Interior announced that the greater sage-grouse did not warrant protection under the Endangered Species Act. However, implementation of sage grouse conservation plans within the Ely District will include active management techniques to improve sage grouse habitat quality, maintain or increase management unit populations, and maintain or increase sage grouse numbers.
- Increased off-highway vehicle use from population growth in Clark County – Off-highway vehicle use has shifted to Lincoln and White Pine counties as areas of BLM-managed land in Clark County have been closed. As the population of Clark County increases, the demand for recreation use in the Ely District is expected to continue increasing through the next 20 years.
- Wildland fire – The area burned by wildfire would continue to vary greatly from year to year. While it is very difficult to quantify the number of acres that could be affected, the agency preferred alternative would collectively cover larger areas than in past years. For the cumulative impact analysis, it has been assumed that an additional 600,000 acres could be affected.
- Drought – Over the past 6 to 7 years, most of the western U.S. has experienced drought. Parts of Nevada have been described as being in “extreme drought” by the U.S. Department of Agriculture (Las Vegas Review-Journal, April 12, 2004). This drought is threatening crops and pastures, has raised the potential for wildfires, and has affected BLM’s ability to manage and succeed at restoration actions.
- Expansion of pinyon and juniper trees and other woody species – Over the past 150 years, trees have increased in woodlands, spread into shrublands and grasslands, and are expected to continue expansion.



- Spread of forest diseases – Several years of drought in western states have resulted in severe stress on pinyon pines. This stress has made the trees less able to fend off attacks by insects such as the Ips beetle. As mentioned in Section 3.5, white pine blister rust also is infecting and causing mortality in bristlecone pines north and west of the Ely District. It is expected to infect neighboring mountains in the foreseeable future.
- Spread of noxious/invasive weeds – Noxious and invasive weeds continue to spread on all lands, both public and private, reducing natural biodiversity, vegetation production, and soil productivity. Due to their tolerance of fire and rapid spread into burned areas, invasive annual grasses such as cheatgrass and red brome are expected to remain a serious long-term challenge in the Ely District.
- Spread of West Nile virus – In 2002 and 2003, the West Nile virus (transmitted by mosquitoes) began to cause bird, horse, and human deaths in Colorado and Utah. The virus expanded into Nevada in 2004 and is now present in White Pine and Clark counties.



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### 4.28.2 Air Quality

#### Geographic Area for Analysis

The cumulative effects area for air resources includes projects and sources up to 100 kilometers beyond the District boundary.

#### Impacts of the Proposed Action (Alternative E)

The existing air quality of the Ely District is typical of the largely undeveloped regions of the western United States. For the purposes of statewide regulatory planning, this area has been designated as attainment for particulate matter with an aerodynamic diameter of 10 microns or less. (PM<sub>10</sub>) and is unclassified for all other criteria air pollutants. The region is designated as a Class II area under the Prevention of Significant Deterioration regulations. The Class II designation allows for moderate growth or some degradation of air quality within certain limits above baseline air quality.

Under the Proposed Action, emissions from wildland fires would affect the air resource. At the present time, wildfires produce higher levels of smoke emissions than historical fires, because fuel available to be consumed by wildfire has increased.

Within the Ely District, the proposed use of prescribed fire is expected to result in an increase of smoke emissions. As natural sources, wildfires are not subject to air quality regulations, whereas prescribed fires and managed natural wildfires are subject to applicable smoke management regulations, including permitting. For each prescribed fire emitting more than 1.0 ton of PM<sub>10</sub> and smaller, a permit application must be completed and submitted to the Nevada Division of Environmental Protection. Final approval must be obtained 24 hours prior to ignition and will be based on ambient air quality conditions. Prescribed fires are generally smaller, less intense, and shorter in duration than wildfires, and would be expected to have fewer impacts to human health and environment in the District than unplanned wildfires.

#### Impacts of the Interrelated Projects

Present actions in the Ely District that affect air resources are mainly related to mining and vegetation management/fire management practices. In the Bald Mountain Mining District, open-pit gold mining generates particulate emissions and gaseous emissions from stationary and mobile sources. The Reid Gardner Station located near Moapa was permitted in 1980 and may emit 675 tons per year of oxides of nitrogen, 317 tons per year of sulfur dioxide, and 33 tons per year of PM<sub>10</sub>. Particulate matter produced by land management activities or natural events on federally-administered lands originates from wildfire, prescribed burning, road or wind-blown dust, volcanic eruptions, construction, mining, and vehicle use. Most particulate matter of concern is produced from fire, and most of this is PM<sub>10</sub>.

Expected future actions in the Ely District that would involve the air resource would be related to potential electric generating power projects. If constructed, the Toquop Energy Project would be a 1,100 megawatt gas-fired power plant located northwest of Mesquite, Nevada. The air permit application for the power plant indicates that it may emit 435 tons per year of PM<sub>10</sub>, 227 tons per year oxides of nitrogen, and 223 tons per



year of sulfur dioxide. The White Pine County coal-fired power plant may be constructed in the near future in Steptoe Valley between Cherry Creek and the town of McGill, Nevada. This power plant is still in the early design stages and no estimate of emissions of pollutants is available. Stringent permitting requirements exist with the Nevada Division of Environmental Protection and U.S. Environmental Protection Agency that would require modern control technology to limit the emissions and impacts from any new power plant that would affect air quality in the cumulative effects area.

Other potential mining sources include the Robinson Mine, a copper mine located west of Ely, Nevada, that has reopened and resumed open-pit mining due to the recent increase in copper prices. The Bald Mountain Mine may expand its operations in the Mooney Basin area, depending on future gold prices. Mines can be substantial sources of particulates due to fugitive dust from disturbed areas, haul roads, and loading and unloading trucks. Particulates generated during mining activities are generally more coarse than those resulting from combustion and will deposit closer to the sources. As such, mining does not have the potential to contribute as much to cumulative impacts across a broad region, but is more likely to have local impacts.

A number of reasonably foreseeable projects could have shorter-term and smaller air quality impacts (such as fugitive dust) within the District including water development projects such as the one proposed by the Southern Nevada Water Authority, the Coyote Springs residential development, paving of the Kane Springs road, construction work on the road from Caliente to Mesquite, and potentially rebuilding existing dams. Expansion or reopening of existing mines in the District would have similar small effects on the overall air quality within the District.

Protection of visibility in Class I areas threatened by reasonably foreseeable development of large stationary sources such as power plants is largely the responsibility of state regulators. Many states have adopted visibility protection plans as part of their State Implementation Plans, which dictate when and how much burning can take place. However, the State Implementation Plan for Nevada does not currently include visibility protection plans. Class I areas are subject to the most limiting restrictions regarding how much additional pollution can be added to the air. Fine particulate matter,  $PM_{2.5}$ , is the primary cause of visibility impairment. Emissions from wildfires and prescribed burning, which stay suspended for many miles, are in the 0.1 to 2.5 micron size class and generally reduce visibility. Management of prescribed burns and reducing the size of wildfires are measures that could reduce visibility impacts to sensitive areas.

### **Cumulative Impacts Conclusion**

Cumulative impacts include those caused by sources and activities associated directly with Alternative E and those caused by interrelated projects that have occurred historically, projects that are currently underway, and those that might reasonably occur in the future. Air resources in the District are mainly affected by mining and vegetation management/fire management practices. Regulatory decisions related to industrial development and mining would prevent significant air quality degradation by applying mitigation measures on a case-by-case basis. Two potential electrical generating power projects would affect air quality in the region if constructed. Permitting requirements of the Nevada Division of Environmental Protection and the U.S. Environmental Protection Agency would require modern control technology to limit



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emissions and impacts from these potential sources. Fire management treatments would include in-depth planning and analysis of potential incident and cumulative air quality impacts to reduce emissions associated with fires. Projected cumulative impacts are of such a nature that the District should be able to meet all applicable local, state, Tribal, and National Ambient Air Quality Standards under the Clean Air Act (as amended), and prevent significant deterioration of air quality within the Ely District from all direct and authorized actions.

### **Variation in Cumulative Impacts between the Preferred Alternative and Other Alternatives**

Alternative A: Same as Alternative E.

Alternative B: Same as Alternative E.

Alternative C: Same as Alternative E.

Alternative D: Same as Alternative E.



### 4.28.3 Water Resources

#### Geographic Area for Analysis

The cumulative effects area for water resources includes the closed to semi-closed basins of White Pine, Lincoln, and northeastern Nye counties located within the boundaries of the Ely District. The mountain ranges and valleys that feed into the Ely District also are part of the cumulative effects area for water resources. A portion of the lower Colorado River Basin, notably the Virgin River and Muddy River tributaries and downstream, also is included in the cumulative effects area.

#### Impacts of the Proposed Action (Alternative E)

Alternative E would minimize impacts on water resources through vegetation management, management of wild horses, and administration of commodity-producing activities in balance with ecosystem and natural resource objectives. Mineral extraction would be managed to minimize impacts to streams and water bodies, and watershed management would be designed to improve water quality in perennial and intermittent streams. Fire management would reduce the impact of wildfires, and noxious weed management would enhance water quantity and quality. Livestock grazing, recreation, and other uses would be administered in an approach that is balanced with ecosystem objectives. There may be short-term effects on water quality from additional sediment or chemical inputs stemming from vegetation treatments. These are expected to be minimal as a result of the implementation of best management practices by BLM.

Water uses by livestock and wild horses may decrease somewhat, and intensively-used areas (such as riparian/wetland areas around springs or ponds) may recover to the extent that water quality characteristics would be expected to improve. Watershed restoration efforts would be expected to improve water quality as well.

Colorado River salinity issues are described in Section 3.3, Water Resources. Salinity is the major quality concern for the river; water resource and land managers along its entire length must consider the consequences of their activities on this issue. The BLM is fully involved in a multi-agency salinity control forum that targets salinity reduction. Efforts by the Ely District to control soil erosion and minimize soil salinization through removal of tamarisk provides benefits to the overall BLM program. However, given the size of the Colorado River tributary watershed within the District (6,800 square miles), in comparison to the overall river basin area (250,000 square miles), any management activity or alternative will not have measurable effects on Colorado River salinity. The vast majority of salinity contributions, and potential activities for its control, occur elsewhere in the Colorado River Basin.

#### Impacts of the Interrelated Projects

Agricultural development in the Ely District consists mainly of irrigated crops in some of the major valleys of White Pine and Lincoln counties, especially those near population centers. Irrigation diversions consume surface water and water from shallow alluvial groundwater found in the valleys, as a general rule. Upstream



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of District lands, the vast majority of perennial streamflows are diverted by agriculture as they exit the mountain fronts. Agriculture in east-central Nevada consumes about 5 acre-feet of water per acre of irrigated land on an average annual basis. For crop irrigation in the Ely District, this amounts to a total irrigation use of about 320,000 acre-feet of water per year. This water use for irrigation is expected to continue into the future for at least another 20 years. Due to the privately-held nature of most cropland resources and water rights, the Proposed Action (Alternative E) would have little or no effect on these water uses. Due to their location, extent, and/or compliance with regulatory programs, agricultural practices and industrial activities are expected to generate minimal water quality changes in the District overall, both during and after watershed restoration programs. Similarly, the potential for water quality changes resulting from the use of water resources by existing water rights holders in accordance with their current rights, are expected to be comparatively minor on BLM-administered lands during and after watershed restoration.

Expected future actions in the Ely District that would affect water resources involve consumption of water for residential development, construction and operation of power plants, reopening of mines, and continued agricultural demand for water. The Coyote Springs residential development is in the early stages of planning. The estimated groundwater demand for this development is about 20,000 acre-feet per year for an indefinite period of time. The groundwater would probably come from alluvial basin aquifers.

The Lincoln County Land Act sale for residential development of semi-arid land in southern Lincoln County would entail pumping about 13,500 acre-feet of water per year for an indefinite period of time from hydrologic basins in southern Lincoln County. Basins with pending water applications include Tule Desert, Clover Valley, Kane Springs Valley, and Lower Meadow Valley Wash. The water would be pumped from bedrock aquifers. The long-term impact of pumping this amount of water for an indefinite period of time is uncertain.

The Toquop Energy Project would be a 1,100-megawatt gas-fired power plant located northwest of Mesquite, Nevada. The EIS for this project identifies an anticipated water consumption requirement of up to 7,000 acre-feet of water per year for the life of the power plant, which would be approximately 50 years (BLM 2003g). The water would come from the Tule Desert hydrologic basin and be obtained with bedrock groundwater wells. This groundwater would be in addition to any water taken from Tule Desert for the Lincoln County Land Act sale residential development. No impacts to natural bedrock springs are expected from this project.

The White Pine County coal-fired power plant may be constructed in the near future in Steptoe Valley between Cherry Creek and the town of McGill, Nevada. This power plant is still in the early design stages, but is expected to require a maximum of 26,000 acre-feet of water per year. It is currently expected that the water would come from 22 wells that White Pine County holds the rights on.

The Robinson Mine, a copper mine located west of Ely, Nevada, has reopened and resumed open-pit mining due to the recent increase in copper prices. The mine pits at the Robinson Mine require dewatering and approximately 5,700 acre-feet of water per year would be pumped from bedrock wells to keep the mine pits dry. The water would be consumed by the mine for processing of ore and other mine-related water needs. The projected impact to groundwater resources would not extend beyond the mining district and would not affect municipal water supplies (BLM 1994). The Bald Mountain Mine may expand its operations



in the Mooney Basin area, depending on future gold prices. If the mine expands to accommodate additional ore bodies, the mine would require about 1,100 acre-feet of additional groundwater per year. This water would come from bedrock groundwater aquifers. Impacts to natural springs are not expected.

It is expected that there also would be some residential developments that are only in the early stages of planning. These additional residential developments would be expected to have a cumulative effect on groundwater resources through the demand for residential water. At present, the level of this demand is unknown.

As described in Chapter 3.0, the Southern Nevada Water Authority is considering various water supply alternatives for the Las Vegas region. The most significant of these in relation to the Ely District involves the transfer of groundwater from Lincoln, Nye, and White Pine counties via pipeline into the Las Vegas area. Depending on the groundwater source areas and the timing and amount of groundwater withdrawal, implementing such a supply alternative could create significant effects on springs, seeps, playas, lakes, and riparian/wetland areas.

An additional effect may be generated by the Comins Lake project. Assuming a free-water surface evaporation rate of about 4 feet per year, a proposed expansion of Comins Lake (near Ely) by about 600 acres, would induce additional surface water losses in the District by 2,400 acre-feet per year. This is not expected to affect District management plans, nor are District water resources management effects anticipated to significantly affect the planned lake expansion.

### **Cumulative Impacts Conclusions**

Cumulative impacts of Alternative E would be minimized over the long term by extensive vegetation management and administration of other land uses that would consider a balanced ecosystem approach. Salinity inputs to the Colorado River system would be reduced over time. Short-term increases in runoff, soil erosion, and related sedimentation may occur on those areas where vegetation treatments occur. Interrelated projects would have the potential to create impacts on both surface and groundwater resources through additional erosion and sedimentation as a result of land disturbance, further consumption of available water resources, and additional releases of undesirable water quality constituents (e.g., industrial chemicals, treated domestic effluent) into receiving waters. The enhanced vegetation resiliency resulting from Alternative E should help offset the effects of the interrelated projects on water resources.

### **Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives**

Alternative A: Less short-term, greater long-term impacts than Alternative E.

Alternative B: Similar short-term and long-term impacts to Alternative E.

Alternative C: Greater short-term and long-term impacts than Alternative E.

Alternative D: Greater short-term and long-term impacts than Alternative E.



### 4.28.4 Soil

#### Geographic Area for Analysis

The cumulative effects area for soil resources consists of the Ely District and a small portion of the Colorado River basin, including portions of the Muddy River and Virgin River drainages.

#### Impacts of the Proposed Action (Alternative E)

Under the Proposed Action, short-term increases in erosion and sedimentation would be expected as a result of the substantial area subject to vegetation treatments. Long-term reduction in erosion and sedimentation is anticipated as perennial understory cover and near-surface root biomass increase over the current condition in these areas. Additional soil resources would be exposed to herbicide treatments, but implementation of best management practices would minimize impacts. Soil salinization and resulting salinity inputs to drainages would decrease as a result of tamarisk control. Impacts on soils from producing commodities such as livestock, recreation, wild horses, and minerals would remain similar to or decrease from those of the current conditions and management approaches.

#### Impacts of Interrelated Projects

Impacts of interrelated projects would include those potentially resulting from the Toquop Energy Project, the Coyote Springs residential development, and re-opening or expansion of mining activities in the District such as the Robinson Mine or the Bald Mountain Mine. Soil resource impacts from these projects would include the excavation, removal, and possible replacement of soil materials, which would generally result in a loss of productivity. Additional impacts may include compaction and increased erosion hazard, as well as areas of contaminated soil from inadvertent chemical spills. Such impacts would be minimized to the extent possible by applicable regulatory programs and corresponding implementation of erosion controls, spill prevention and countermeasures, stormwater pollution prevention plans, and reclamation/site restoration activities.

If extensive groundwater withdrawals are made by the Southern Nevada Water Authority, further impacts may occur to soil moisture regimes in riparian/wetland areas. If water tables are lowered as a result of groundwater withdrawals, then it may be possible for riparian/wetland areas to become drier. The potential degree and extent of such effects is unknown.

#### Cumulative Impacts Conclusion

Cumulative impacts of Alternative E and interrelated projects would involve a short-term increase of erosion and sedimentation, with accompanying reduction in soil productivity, when the activities are initially undertaken. Extensive vegetation treatment on the District would, in time, result in substantial reduction of erosion and sedimentation. Similarly, soil productivity would increase over the long term as a result of vegetation treatments. Impacts from interrelated project development within the District would result in permanent removal or alteration of soil resources in specific areas (such as project footprints or some riparian/wetland areas). Regulatory programs (including permit approval and monitoring processes), and the



implementation of best management practices and mitigation measures, would reduce the degree of overall erosion and sedimentation impacts. Soil productivity would be lost in the comparatively smaller areas affected by interrelated projects, but would improve over widespread areas with successful vegetation restoration.

**Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives**

Alternative A: Less short-term, greater long-term impacts than Alternative E.

Alternative B: Cumulative impacts would be the same as Alternative E.

Alternative C: Cumulative impacts would be greater than Alternative E.

Alternative D: Cumulative impacts would be greater than Alternative E, particularly over the long term.



### 4.28.5 Vegetation

#### Geographic Area for Analysis

The geographic area for cumulative impacts to vegetation is the area within the boundaries of the Ely District.

#### Impacts of the Proposed Action (Alternative E)

Direct effects of Alternative E on vegetation would include treatment over the next several decades of approximately 6.2 million acres that do not currently meet the criteria for being in healthy conditions (see **Tables 2.4-1** and **4.5-1**). Approximately 50 percent of the potential treatment area is in the sagebrush communities; approximately 44 percent in pinyon-juniper woodland communities; approximately 4 percent in salt desert shrub communities; approximately 1 percent in nonnative seedlings; and approximately 1 percent collectively in high elevation conifer, mountain mahogany, and aspen communities. Within the overall distribution of these vegetation types within the Ely District, approximately 55 percent of the sagebrush, 77 percent of the pinyon-juniper, 18 percent of the salt desert shrub, 30 percent of the nonnative seedlings, 79 percent of the high elevation conifer, 50 percent of the mountain mahogany, and 59 percent of the aspen are identified for potential treatment. Treatment of these sites is necessary to reestablish the desired vegetation composition and restore resiliency. Impacts including increased erosion and spread of invasive species could occur in the event that a treatment is unsuccessful in achieving prompt revegetation. Numerous other aspects of Alternative E would indirectly affect vegetation in an offsetting manner through changes in management of wild horses, travel management and off-highway vehicle use, woodland and native plant products, fire, and special designations. Various additional indirect effects would occur through management changes related to lands and realty, renewable energy, recreation, and mineral extraction.

#### Impacts of the Interrelated Projects

The primary past actions that have affected vegetation are historic mining activities and other human-caused surface disturbances, wildland fires and fire suppression, and historic grazing practices. Surface disturbances have affected only a small percentage of the total area within the District. Past grazing practices (including use by livestock and wild horses, and fire suppression) however, have been major contributors to current deteriorated vegetation conditions throughout the District. Partially due to these conditions, the spread of invasive and noxious weeds now threatens most of the ecological systems in the District, accentuating the need for prompt and effective restoration treatment.

Present actions affecting vegetation composition and ecological health include livestock and wildlife management, wild horse management, wildland fires, and watershed management. These various actions have been addressed herein as part of Alternative A in Section 4.5. Vegetation also is affected by factors largely outside BLM's management, such as drought conditions, insects, occurrence of wildland fires, and introduction of invasive species in conjunction with disturbances on nearby private lands.

Key future actions anticipated to affect vegetation include potential restrictions associated with any additional species listings under the Endangered Species Act (a reduced or remote probability under



Alternative E), and the same natural processes mentioned above such as fire, insects, and drought. These have the potential to contribute to further ecological deterioration with increased spread of invasive species.

### **Cumulative Impacts Conclusion**

The actions related to Alternative E would enhance vegetation resiliency on a long-term basis, although some elements of the alternative would contribute to temporary loss of vegetation and potential spread of invasive species. Most of the interrelated projects have produced or would result in the removal of native vegetation and potential spread of invasive species, either through physical disturbance or alteration of vegetation communities. The enhanced vegetation resiliency resulting from Alternative E should offset a large portion of the past and potential future disturbance effects from interrelated projects.

### **Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives**

On a short-term basis, the primary factors involved are those that affect the spread of invasive species, contribute to loss of native vegetation diversity and vigor, or constrain the selection of treatments and resultant success for restoration of deteriorated sites. The primary long-term factors include actions that would impact the maintenance of resiliency on restored areas, such as grazing by livestock, wildlife, and wild horses.

Alternative A: Greater short-term, greater long-term impacts than Alternative E.

Alternative B: Same short-term, same long-term impacts as Alternative E.

Alternative C: Same short-term, greater long-term impacts than Alternative E.

Alternative D: Greater short-term, greater long-term impacts than Alternative E.

#### ***RMP Management Focus***

*The restoration and maintenance of healthy ecological systems within watersheds is a primary focus for the future management of the Ely District. Healthy ecological systems are geographically diverse and change over time. They are compatible with soil potential and are resilient to disturbance.*

*Resources and resource uses will be managed to restore or maintain ecological health. Certain resource management changes and active treatments may need to be implemented, in portions of watersheds, to accomplish this objective. Adaptive management will be pursued to avoid deteriorating conditions favoring invasive plants and catastrophic fires. Any projects will be implemented so as to result in a mosaic of vegetation within a watershed.*

*In the long term, natural disturbance (such as drought or fire) will occur and fewer treatments will be needed to maintain ecological health. The result will be a variety of vegetation phases within a watershed, which will provide diverse, healthy conditions for future generations.*



### 4.28.6 Fish and Wildlife

#### *Fisheries*

##### Geographic Area for Analysis

The geographic area for the cumulative impact analysis for fisheries includes perennial drainages within the Ely District that support game fish and nonnative fish species. The study area also includes perennial drainages that are connected to District-drainages and located immediately downgradient from the District boundary (e.g., Virgin River).

##### Impacts of the Proposed Action (Alternative E)

Under Alternative E, the BLM would work with the Nevada Department of Wildlife to manage aquatic and riparian habitat for the purpose of maintaining and enhancing existing nonnative fisheries. Management also would enhance native fisheries whenever possible and balance strategies to identify, minimize, or eliminate conflicts between native and nonnative fisheries. Other programs such as vegetation treatment, wildlife management, wild horses, lands and realty, travel management, recreation, livestock grazing, woodland product harvests, mineral extraction, fire management, and noxious weeds could cause sedimentation and habitat alteration due to surface disturbance. Alternative E would not result in additional water use or affect fish habitat in terms of stream flows or water levels in reservoirs.

##### Impacts of the Interrelated Projects

A continuation of current and future activities involving road development, water development, livestock grazing, agricultural development, off-highway vehicle use, and land development would contribute to effects on fish habitat. Natural processes such as wildland fires and drought also would affect habitat by contributing to sedimentation, loss of riparian vegetation, and reduction in available wetted area. Impacts from water use could potentially alter flows in streams and affect the quantity of habitat. Surface disturbance activities could contribute to increased sedimentation in the drainages. Activities on public lands would implement erosion control measures to reduce sediment input to water bodies. Agricultural activities also could contribute fertilizers and pesticides in runoff or irrigation return flows.

Surface disturbance activities involving grazing and recreation use on land surrounding Comins Lake would result in localized sediment effects on fish habitat. The Bassett Lake and Comins Lake expansion projects would enhance fish habitat by increasing wetted area in the reservoirs. Short-term and temporary sedimentation would occur in the construction area in or adjacent to the reservoirs. However, erosion-control would be required to minimize sediment input to the lakes.

##### Cumulative Impacts Conclusion

The cumulative effects of interrelated projects in combination with program-specific management under Alternative E would generally improve maintenance and quality of fish habitat in the long term as restoration



efforts improve both upland and riparian habitat conditions. This habitat improvement would tend to offset continued habitat losses and damage resulting from various interrelated projects including potential groundwater withdrawal.

#### **Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives**

Alternative A: In comparison to Alternative E, Alternative A would be expected to result in slightly less impacts on a short-term basis and greater impacts on a long-term basis. This prediction is based on the differences in treated areas under Alternatives A and E.

Alternative B: Same as Alternative E.

Alternative C: Same as Alternative E, on a short-term basis. On a long-term basis, sediment input could be greater due to widespread fires.

Alternative D: Cumulative effects of interrelated projects in combination with Alternative D would be less than Alternative E in terms of surface disturbance as a result of less vegetation treatments. Under Alternative D, sediment input could be greater on a long-term basis mainly due to widespread fires.

#### ***Wildlife***

##### **Geographic Area for Analysis**

The geographic area for cumulative impacts to wildlife is the area within the boundaries of the Ely District.

##### **Impacts of the Proposed Action (Alternative E)**

Impacts would include the long-term loss of woody vegetation (i.e., trees, woodlands, and shrubs) and the temporary loss of forage and cover in the areas being treated until the desirable perennial species become reestablished. It is anticipated that treated areas would result in increased herbaceous forage and ground cover for wildlife in the short term, followed by the establishment of shrub vegetation in the long term that meet the desired range of conditions for vegetation communities, as described in Section 2.5.5, Vegetation. On a watershed level, restoration activities would result in higher quality forage, increased cover and vegetation structure, and increased habitat quality for wildlife. On a landscape level, restoration activities to achieve appropriate ranges of vegetation conditions would improve wildlife habitats by reducing habitat degradation and fragmentation, and promoting ecological health and resiliency.

A reduction in wild horse herd management areas and overall populations would improve wildlife habitats by increasing herbaceous forage and water availability in the short term, followed by an increase in overall habitat quality in the long term, particularly within the Mojave Desert ecological system.



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### Impacts of the Interrelated Projects

Cumulative effects to wildlife resources from past, present, and reasonably foreseeable interrelated projects and management actions that result in surface disturbance activities would be directly related to habitat loss or alteration, and habitat fragmentation. Habitat loss or alteration would result in direct losses of smaller, less mobile species (e.g., small mammals and reptiles), and the displacement of more mobile species into adjacent habitats that may currently be at or near carrying capacity.

Ongoing and future interrelated actions would continue to impact wildlife habitat and species within the District. Although restoration of vegetation communities would be managed to promote ecological system health on a watershed management basis, reductions in habitat availability and quality would continue in areas that occur outside of BLM jurisdiction. Natural processes such as fire and drought would continue to result in localized habitat reductions and the spread of noxious and invasive weed species.

### Cumulative Impacts Conclusion

The actions related to Alternative E would improve wildlife habitat conditions on the watershed level and landscape level in the short and long term. However, the interrelated projects either have produced or would result in direct wildlife mortality, displacement of wildlife, habitat loss or alteration, and increased habitat fragmentation. The habitat improvement resulting from the vegetation restoration treatments should offset a large portion of the past and potential future habitat losses and damage resulting from interrelated projects.

### Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives

On a short-term basis, the primary factors involved are those that affect the spread of invasive vegetation species and the expansion of pinyon and juniper trees, contribute to the loss or reduction of native vegetation cover and structure, or constrain the selection of treatments and resultant success for restoration of deteriorated habitats. The primary long-term factors include actions that would impact or benefit wildlife by reducing habitat degradation and fragmentation and promoting ecological health and resiliency.

Alternative A: Greater short-term, greater long-term impacts than Alternative E.

Alternative B: Same short-term, fewer long-term impacts than Alternative E.

Alternative C: Greater short-term, greater long-term impacts than Alternative E.

Alternative D: Greater short-term, greater long-term impacts than Alternative E.



#### 4.28.7 Special Status Species

##### *Special Status Plant Species*

##### Geographic Area for Analysis

The geographic area for cumulative impacts to special status plants is the area within the boundaries of the Ely District.

##### Impacts of the Proposed Action (Alternative E)

Vegetation management programs would include surveying and monitoring federal lands for Ute ladies'-tresses orchid, based on the availability and assistance of the U.S. Fish and Wildlife Service. The U.S. Fish and Wildlife Service would identify potential habitat areas for the species. Conservation and recovery actions would be implemented for any populations observed within the District. Monitoring and inventorying measures would be developed and implemented for the Sunnyside green gentian.

Eighteen new ACECs totaling 132,900 acres would be established for the protection of other resources. The establishment of these ACECs and the land use restrictions associated with these ACECs may have a minimal effect on known and potential habitat for special status plants in these areas. A detailed analysis of potential impacts to special status plants would be completed during watershed and habitat assessments. As part of the standard operating procedures, potential mitigation measures and monitoring would be developed on a site-specific basis. Therefore, implementation of Alternative E would result in minimal impacts to special status plants.

##### Impacts of the Interrelated Projects

Cumulative impacts to special status plants from past, present, and reasonably foreseeable future actions include the loss of habitat and plants and degradation of habitat as a result of surface-related disturbances associated with natural processes (e.g., wildfire) or human activities (e.g., mine development, road and railroad construction, and agricultural and livestock uses). Standard operating procedures, mitigation measures, and monitoring have been implemented for some of the past actions and would be implemented for present and reasonably foreseeable future actions to minimize impacts to special status plants. Therefore, cumulative impacts to special status plants as a result of interrelated projects would be minimal.

##### Cumulative Impacts Conclusion

The impacts related to Alternative E would have minimal effect on the Ute ladies'-tresses orchid, Sunnyside green gentian, and other special status plants on an overall basis. Most of the interrelated projects have produced or would produce minimal effects to special status plants, either through physical disturbance or alteration of vegetation communities. The improved knowledge base and potential mitigation measures



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related to Alternative E should offset a large portion of the past and potential future adverse effects from interrelated projects.

### **Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives**

Alternative A: Greater potential for impact than Alternative E because inventories and monitoring would not be completed for the Ute ladies'-tresses orchid and Sunnyside green gentian.

Alternative B: Same as Alternative E.

Alternative C: Greater potential for impact than Alternative E because inventories and monitoring would not be completed for the Ute ladies'-tresses orchid and Sunnyside green gentian.

Alternative D: Greater protection than Alternative E relative to physical disturbances from other uses, but greater risk than Alternative E from major wildfire events. Overall comparable impacts to Alternative E.

### ***Special Status Aquatic Species***

#### **Geographic Area for Analysis**

The geographic area for the cumulative impact analysis for special status aquatic species includes perennial drainages and springs within the District that provide occupied and designated critical habitat for sensitive aquatic species. The analysis area also includes perennial streams and springs on private, state, or Tribal lands that are connected to drainages within the District and located immediately downgradient from the District boundary (e.g., Virgin River and springs that provide occupied and designated critical habitat for special status species).

#### **Impacts of the Proposed Action (Alternative E)**

Under Alternative E, special status fish species would be managed through evaluations of their overall specific habitat conditions and factors affecting their populations district-wide and through habitat restoration and multiple use restrictions at the watershed level. Maintenance and mitigation measures would continue to be implemented where multiple-use impacts occur or where habitat or populations are at or near their maximum natural levels.

Habitat for the Pahrump poolfish (Shoshone Pond) would be improved under Alternative E by building a new fence to exclude both human and livestock access. The fenced area also would be expanded in size to exclude new surface disturbance and minimize sedimentation and runoff from upland areas. The fenced area would be reseeded to minimize sedimentation input to the ponds.



**Impacts of the Interrelated Projects**

The following information summarizes cumulative actions in relation to individual species based on geographical areas within the District.

- **Big Spring Spinedace, Meadow Valley Wash Desert Sucker, and Meadow Valley Wash Speckled Dace:** Cumulative actions in the area include the Pioche Mining District, expansion of the Panaca pozzlana mine, grazing, wildfire, drought, and recreation use. Competition from nonnative fish species also presents a threat to Big Spring spinedace (U.S. Fish and Wildlife Service 1993). Land development in the general area could use groundwater that may affect surface flows in Meadow Valley Wash. The Condor Canyon Habitat Management Plan was implemented in 1990 to protect the species. However, the management actions ceased after a wildfire burned the canyon in 1999. The Lower Meadow Valley Multispecies Habitat Conservation Plan (in preparation) is designed to protect habitat for these species in the lower Meadow Valley Wash.
- **Pahrump Poolfish:** Cumulative actions for the Shoshone Ponds Area include wildfire, drought, and recreation. Maintenance of adequate water levels, which provide the necessary wetted area and associated habitat parameters, is an important factor for the species.
- **White River Springfish:** Cumulative actions in the Ash Springs area include agricultural water use and grazing on adjacent private lands. Competition with nonnative fish species and diseases also provide threats to the species. Maintenance of adequate water levels is an important factor for the species.
- **Hiko White River Springfish, Pahrangat Roundtail Chub, and White River Spinedace:** These fish species occur on private land in the White River Valley. Cumulative actions for these species include agricultural water use and surface disturbance, grazing, wildfire, and drought conditions. Competition and predation from nonnative fish species is a threat to the species (U.S. Fish and Wildlife Service 1994, 1998). Maintenance of adequate water levels, which provide the necessary wetted area and associated habitat parameters, is an important factor for the species.
- **Railroad Valley Springfish:** This fish species occurs on the Duckwater Indian Reservation. Cumulative actions in the area include agricultural water use and surface disturbance, grazing, wildfire, and drought conditions. Competition and predation from nonnative fish species is a threat to the species. The Railroad Valley Habitat Management Plan was implemented to protect spring habitat for this species (U.S. Fish and Wildlife Service 1996).
- **Virgin River Chub and Woundfin:** These fish species occur in the Virgin River drainage, which is located south of the District boundary. Current and future use of water for land development in Lincoln County could possibly affect surface flows if groundwater is connected to the Virgin River.



### Cumulative Impacts Conclusion

In spite of a management emphasis in Alternative E on protecting habitat for sensitive aquatic species, surface disturbance activities could result in localized water quality changes due to sedimentation or runoff contaminants, and habitat alteration or loss. Several programs such as vegetation restoration and weed management (i.e., tamarisk removal) could increase stream flows and spring discharges. Several of the interrelated projects could result in changes to surface water quantity in various streams or springs (e.g., groundwater withdrawal). In the long term, vegetation restoration could reduce stream flows originating from surface runoff, but could locally increase stream base flows and spring discharges. Other interrelated actions could combine with these water quantity changes to affect habitat for sensitive species. The cumulative effects of interrelated projects in combination with program-specific management under Alternative E would result in impacts on sensitive fish species habitat due to surface disturbance in watersheds, but this would be balanced by an increased rate of maintenance and restoration of habitat for sensitive fish species.

### Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives

Alternative A: Cumulative effects would be greater than for Alternative E.

Alternative B: Same as Alternative E.

Alternative C: Same as Alternative E.

Alternative D: Same as Alternative E.

### ***Special Status Wildlife Species***

#### Geographic Area for Analysis

The geographic area for cumulative impacts to special status wildlife is the area within the boundaries of the Ely District.

#### Impacts of the Proposed Action (Alternative E)

Impacts would include the long-term loss of woody vegetation (i.e., trees, woodlands, and shrubs) and the temporary loss of forage and cover in the areas being treated until the desirable perennial species become reestablished. It is anticipated that treated areas would result in increased herbaceous forage and ground cover for special status species in the short term (less than 5 years), followed by the establishment of shrub vegetation in the long term (greater than 50 years) that meet the desired range of conditions for vegetation communities as described in Section 2.5.5, Vegetation. On a watershed level, restoration activities would result in higher quality forage, increased cover and vegetation structure, and increased habitat quality for special status species. On a landscape level, restoration activities to achieve desired ranges of vegetation conditions would improve special status species habitats by reducing habitat degradation and fragmentation, and promoting ecological health and resiliency.



A reduction in wild horse herd management areas and overall populations would improve special status species habitats by increasing herbaceous forage and water availability in the short term, followed by an increase in overall habitat quality in the long term, particularly within the Mojave Desert ecological system.

Desert bighorn sheep habitat would be improved by the exclusion of domestic sheep and goats within nine miles of desert bighorn sheep ranges by increasing herbaceous forage and water availability in the short term. Long term effects would include bighorn sheep expansion into unoccupied ranges, improved overall health of bighorn sheep populations, and improved habitat quality.

### **Impacts of the Interrelated Projects**

Cumulative effects to wildlife resources from past, present, and reasonably foreseeable interrelated projects and management actions that result in surface disturbance activities would be directly related to habitat loss or alteration, and habitat fragmentation. Habitat loss or alteration would result in direct losses of smaller, less mobile species (e.g., small mammals and reptiles), and the displacement of more mobile species into adjacent habitats that may currently be at or near carrying capacity. For example, road development and improvements in interrelated projects could have impacts to desert tortoise ACECs in the southeastern portion of the District, degrading desert tortoise habitat and potentially increasing desert tortoise mortality through collisions with vehicles.

Ongoing and future interrelated actions would continue to impact wildlife habitat and species within the District. Although restoration of vegetation communities would be managed to promote ecological system health on a watershed management basis, reductions in habitat availability and quality would continue in areas that occur outside of BLM jurisdiction. Natural processes such as fire and drought would continue to result in localized habitat reductions and the spread of noxious and invasive weed species.

### **Cumulative Impacts Conclusion**

The impacts related to Alternative E would improve special status species habitat conditions on the watershed level and landscape level in the long term. However, the interrelated projects either have produced or would continue to result in direct special status species mortality, displacement of individuals, habitat loss or alteration, and increased habitat fragmentation. The special status species habitat improvement resulting from Alternative E should offset a large portion of the past and potential future habitat losses and damage resulting from interrelated projects.

### **Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives**

On a short-term basis, the primary factors involved are those that affect the spread of invasive vegetation species and the expansion of pinyon and juniper trees, contribute to the loss or reduction of native vegetation cover and structure, or constrain the selection of treatments and resultant success for restoration of deteriorated habitats. The primary long-term factors include actions that would impact or benefit special



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status species by reducing habitat degradation and fragmentation, promoting ecological health and resiliency, and increasing overall biological diversity.

Alternative A: Greater short-term, greater long-term impacts than Alternative E.

Alternative B: Same short-term, fewer long-term impacts than Alternative E.

Alternative C: Greater short-term, greater long-term impacts than Alternative E.

Alternative D: Greater short-term, greater long-term impacts than Alternative E.



#### 4.28.8 Wild Horses

##### Geographic Area for Analysis

The cumulative effects area for wild horses is the array of existing herd management areas, a buffer around these herd management areas that horses occasionally use when they cross the boundaries, and a few herd management areas that abut the District boundary with the associated horse herds commonly crossing to adjoining areas outside the District.

##### Impacts of the Proposed Action (Alternative E)

Direct effects of Alternative E on wild horses involve the reduction in herd management areas from 24 to 6 with accompanying reductions in total acreage of herd management areas from 5.36 million to 3.7 million acres and in the appropriate management level from a range of 1,986 to 2,141 to a range of 810 to 1,695. This would be a long-term change that would reduce population numbers but improve habitat conditions, health of individual animals, and long-term herd viability. Indirect effects of the alternative include the effects of proposed vegetation restoration treatments which would generally improve wild horse habitat; changes in management of recreation and off-highway vehicle use that would reduce conflicts of such uses with wild horse herds in some herd management areas while increasing conflicts in others; and allocation of a portion of the increased forage production on vegetation treatment areas within herd management areas to wild horses.

##### Impacts of the Interrelated Projects

The primary past actions that have affected wild horse populations and their habitat are livestock grazing, as it affects vegetation resources of the District, and the Wild Free-roaming Horse and Burro Act, as it affects the process of controlling wild horse populations. Numerous other human-caused surface disturbances, wildland fires, and human activities have contributed to current habitat conditions, but generally to a lesser degree than historic grazing practices. Past grazing practices by both wild horses and livestock have been major contributors to current vegetation conditions throughout the District. Partially due to these conditions, the spread of invasive and noxious weeds now threatens most of the ecological systems in the District.

Present actions affecting wild horses are mainly those that affect the habitat available, including the supply of both forage and water within the herd management areas. Key examples include drought conditions, wildland fires, competition with livestock and wildlife, the latter being addressed herein as part of Alternative A in Section 4.8. Ongoing predator control in the District may affect wild horse populations by reducing foal mortality to predation.

Key future actions anticipated to affect wild horses include potential restrictions associated with any additional species listings under the Endangered Species Act (a reduced or remote probability under Alternative E) and the same natural processes mentioned above including fire, drought, and climate change. Each of these has the potential to either reduce areas available for grazing or the level of forage production



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on the available area. Future predator control may affect populations in a positive manner. It seems probable that the West Nile virus will begin affecting wild horses within the District in the next few years. It is not known how the virus will affect horses in the wild, or whether wild herds will be more or less vulnerable to this mosquito-borne disease than domestic horses. Small herds appear to be more vulnerable than larger herds.

### Cumulative Impacts Conclusion

The impacts related to Alternative E generally would improve habitat for wild horse herds on a long-term basis while many of the potential impacts associated with interrelated projects would reduce habitat, but typically to a lesser degree. Thus, the overall cumulative effects would be general improvement in the habitat necessary for long-term herd health and viability.

### Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives

On a short-term basis, the primary factor involved is the acreage of current herd management areas that would be temporarily affected by watershed treatment, fire rehabilitation, or increased competition with other users. The primary long-term factor is the potential for permanent or long-range losses or habitat restrictions associated with potential additional species listed under the Endangered Species Act. Overall summary assessments of these combined factors follow below by alternative.

Alternative A: Less short-term, greater long-term impacts than Alternative E.

Alternative B: Same short-term, greater long-term impacts than Alternative E.

Alternative C: Same short-term, greater long-term impacts than Alternative E.

Alternative D: Greater short-term, greater long-term impacts than Alternative E.



#### **4.28.9 Cultural Resources**

##### **Geographic Area for Analysis**

The geographic area for cumulative impacts to cultural resources is the area within the boundaries of the Ely District.

##### **Impacts of the Proposed Action (Alternative E)**

Cumulative impacts to cultural resources could occur through incremental degradation of the resource base from a variety of sources, which reduce the information and interpretive potential of cultural properties. Other regional resource, land use, and economic development planning efforts could affect the types and intensity of uses on private, state, or other federal lands within the planning area and could, therefore, potentially affect the regional cultural resource database. Development of lands that are not protected by federal or state cultural resource statutes and regulatory protections could decrease the regional resource base and potentially limit management options within the planning area.

Cultural properties within the District would continue to deteriorate through natural agents, unauthorized public use, and vandalism. Direct impacts associated with land management decisions would be reduced or eliminated in compliance with federal and state cultural resource mandates and existing standard operating procedures, and implementation of use allocations. Under Alternative E, an overall decrease in the number of acres open to livestock/wild horse grazing and off-highway vehicle use and restricting recreational events to specified areas would decrease the use intensity within the District, thereby preserving the regional database for cultural resources. The designation of 11 ACECs for the protection and preservation of cultural sites within the District also would result in an increase in the regional database.

##### **Impacts of the Interrelated Projects**

Surface disturbance activities associated with mining, renewable energy, road development, transmission lines, and fire management have been subject to NEPA review prior to project activities in adherence to federal and state laws. As directed by law, cultural resources eligible to the National Register of Historic Places have been avoided, or if this was not possible, recovered for their scientific value. Data recovery of important cultural sites has expanded the regional database and knowledge of prehistoric and historic contexts. Future actions involving surface disturbing activities would require a similar set of procedures. Impacts associated with off-highway vehicle use and livestock grazing have contributed to the degradation of site settings and incidental damage to cultural sites. These impacts would be mitigated on a case-by-case basis as discovered. Natural-caused disturbances, such as wildland fires, damage or completely destroy cultural resources, in particular historic structures and rock art.

Present management actions affecting cultural resources include planned and dispersed off-highway vehicle use, developed and non-developed recreation, mining activities, and livestock/wild horses grazing. These various actions have been addressed herein as part of Alternative A in Section 4.9.



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Key future actions anticipated to affect cultural resources include the same array as mentioned above; however, the effects are expected to decrease under Alternative E.

### **Cumulative Impacts Conclusion**

There would be a high level of protection of cultural resources under Alternative E (overall decrease in lands available to off-highway vehicle use and livestock/wild horse grazing and the designation of ACECs to protect cultural resources) offsetting the expected increase in visitor and recreation use in the District. Thus, the overall cumulative effects would be negligible.

### **Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives**

Cultural resources are nonrenewable; therefore, short-term and long-term impacts are the same depending on when the disturbance would occur. Therefore, analysis of cumulative effects focuses primarily on direct and indirect impacts associated with the various alternatives. An overall summary assessment of direct and indirect impacts follows below by alternative.

Alternative A: Greater direct and indirect impacts than Alternative E.

Alternative B: Similar direct and indirect impacts as Alternative E.

Alternative C: Greater direct and indirect impacts than Alternative E.

Alternative D: Less direct and indirect impacts than Alternative E.



#### **4.28.10 Paleontology**

##### **Geographic Area for Analysis**

The geographic area for cumulative impacts to paleontological resources is the area within the boundaries of the Ely District.

##### **Impacts of the Proposed Action (Alternative E)**

Cumulative impacts to paleontological resources could occur through incremental degradation of the resource base from a variety of sources, which reduce the information and scientific research potential of fossil material. Geological formations with exposures containing vertebrate and invertebrate fossils would continue to be impacted by natural agents. Impacts associated with land management decisions would be minimized or reduced in accordance with federal legislation and existing standard operating procedures, and through implementation of use allocations. Under Alternative E, an overall decrease in the number of acres open to off-highway vehicle use and restricting recreational events to specified areas would decrease the use intensity within the District; thereby preserving the regional database for paleontological resources. Cumulative impacts to paleontological resources are expected to be minimal under the Proposed Action.

##### **Impacts of the Interrelated Projects**

The primary factors that have affected paleontological resources are planned and dispersed off-highway vehicle use, recreation, lands and realty, and mining activities. The direct effects of planned off-highway vehicle use, developed recreation, lands and realty, and mining have been mitigated in compliance with federal legislation and existing standard operating procedures. Impacts associated with dispersed off-highway use and recreation (e.g., trilobite collecting) have increased as visitor and recreational use has increased. Off-highway vehicle use and recreation have been the major contributors to illegal collecting of fossils and soil erosion that exposes subsurface fossil material.

Present management actions affecting paleontological resources include planned and dispersed off-highway vehicle use, recreation, lands and realty, and mining activities. These various actions have been addressed herein as part of Alternative A in Section 4.10.

Key future actions anticipated to affect paleontological resources include the same array as mentioned above; however, the effects are expected to decrease under Alternative E.

##### **Cumulative Impacts Conclusion**

There would be a high level of protection of paleontological resources under Alternative E (overall decrease in lands available to off-highway vehicle use and mineral development, and a registration system for fossil collecting) offsetting the expected increase in visitor and recreation use in the District. Thus, the overall cumulative effects would be negligible.



### Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives

Paleontological resources are nonrenewable, and as such, there is no distinction between short-term and long-term effects. Therefore, analysis of cumulative effects focuses primarily on direct and indirect impacts associated with the various interrelated projects. An overall summary assessment of direct and indirect impacts follows below by alternative.

Alternative A: Greater direct and indirect impacts than Alternative E.

Alternative B: Similar direct and indirect impacts as Alternative E.

Alternative C: Greater direct and indirect impacts than Alternative E.

Alternative D: Less direct and indirect impacts than Alternative E.



#### 4.28.11 Visual Resources

##### Geographic Area for Analysis

The geographic area for cumulative impact analysis of visual resources lies entirely within the Ely District boundary.

##### Impacts of the Proposed Action (Alternative E)

The cumulative impacts to visual resource use would occur through the degradation of visual resources and changes in visual resource management classifications. The elimination of cross-country off-highway vehicle use would potentially reduce vehicle emissions and fugitive dust in the planning area in the short and long term. Vegetation treatments could create visual disturbances in the short term that would lessen over the long term. Co-location of utility rights-of-way and communication sites would serve to lessen long-term impacts. The establishment of visual resource management classes throughout the District would potentially reduce visual impacts by requiring mitigating measures.

##### Impacts of the Interrelated Projects

Potential impacts to visual resources could occur from mining activities in the Bald Mountain mining district; energy projects such as the 345-kilovolt transmission line from Falcon to Gonder, the Toquop energy project, the White Pine County power project, the Southwest Intertie project, and wind energy development; and by the development of the Department of Energy rail line. Those projects could potentially require mitigation actions to reduce visual impacts within areas having more restrictive visual resource management classes (i.e., Class I and Class II areas).

##### Cumulative Impacts Conclusion

Under Alternative E, impacts to visual resources would be minimal, those impacts mainly being from surface disturbances associated with the vegetation treatments, and the reduction in surface disturbances associated with the elimination of cross-country off-highway vehicle use and the co-location of utility rights-of-way and communication sites. Some interrelated projects would result in surface disturbances, increased air emissions, and local visual impacts.

##### Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives

The primary factor involved for long term impacts is the visual resource management classification system established for the District. Effort would be made to design activities to meet the visual resource management classification, and mitigation would be considered to lessen visual impacts. Other impacts would occur from off-highway vehicle use, designation of utility corridors and communication sites, and special designation areas. Vegetation treatments and fire management would result in short-term and long-term impacts.



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Alternative A: Greater impacts than Alternative E due to maintaining over 10 million acres of off-highway vehicle open areas.

Alternative B: Slightly less impacts than Alternative E

Alternative C: Greater impacts than Alternative E due to wider and additional designated utility corridors.

Alternative D: Greater impacts than Alternative E due to non-suppression of wildland fires.



**4.28.12 Lands and Realty****Geographic Area for Analysis**

The geographic area for cumulative impacts to lands and realty is the area within the boundaries of the Ely District.

**Impacts of the Proposed Action (Alternative E)**

The cumulative impacts to the management of lands and realty would occur through the changes in ownership and management of land resources, the availability of lands for disposal, and changes in access to land resources. Under Alternative E, there would be more acreage excluded from disposal and more right-of-way exclusion and avoidance areas resulting from the designation of new ACECs. This amount would be very minor in comparison with the size of the planning area. Co-location of utility rights-of-way and communication sites would be encouraged.

**Impacts of the Interrelated Projects**

Impacts from interrelated projects to lands and realty could come from the Lincoln County Conservation, Recreation, and Development Act, the transfer of lands to American Indian Tribes (the area and location of which are to be determined by Congress), the Placer Dome Land Sale, water development in White Pine and Lincoln Counties, the Coyote Springs residential development, road development, energy development, mining activities, and the development of the Caliente Rail Corridor. Interrelated projects could reduce the amount of developable land with the District and create pressure for development in additional areas.

**Cumulative Impacts Conclusion**

Cumulative impacts to the management of lands and realty would be relatively minor and would occur as a result of new avoidance and exclusion areas and management direction encouraging co-location of utility rights-of-way and communication sites. Interrelated projects could increase pressure for development and create a higher demand for developable lands in the planning area.

**Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives**

The primary factors involved for impacts to lands and realty are the amount of lands available for disposal and the designation of utility corridor widths and communication sites.

Alternative A: Less impact than Alternative E.

Alternative B: Similar impacts to Alternative E

Alternative C: Greater impacts than Alternative E, due to wider utility corridors.

Alternative D: Greater impacts than Alternative E, due to restriction on new land use authorizations and land disposals.



### 4.28.13 Renewable Energy

#### Geographic Area for Analysis

The geographic area for cumulative impacts to renewable energy is the area within the boundaries of the Ely District.

#### Impacts of the Proposed Action (Alternative E)

Cumulative impacts to renewable energy could occur through the degradation of renewable energy resources, reduction in resources available to develop renewable energy (e.g., water for concentrated solar power development), and through changes in management of renewable resources. Assigning restrictive management prescriptions such as special designations or a Class I Visual Resource Management class could limit the availability of some location for renewable energy development. Management under Alternative E would identify areas of potential wind and solar development that exceed the foreseeable demand and would be the most viable locations for wind and solar energy development. Development proposals would still be handled on a case-by-case basis subject to NEPA analysis, and not restricted to the areas identified as potential wind and solar development areas.

#### Impacts of the Interrelated Projects

Impacts from interrelated projects to renewable energy could come from power plant and transmission line development, as well as water development. Interrelated power and transmission projects could make renewable energy development more economically viable by potentially increasing access to transmission lines, building more transmission capacity, and possibly through the construction of converter stations. Power plants, water development, and residential development could have impacts in terms of reducing the amount of water available for solar energy development.

#### Cumulative Impacts Conclusion

Interrelated power plant and transmission line projects could create better access to electrical transmission lines. Interrelated power plants, water development, and residential development projects could impact renewable energy development through the use of water that could otherwise be used for development of concentrated solar power.

#### Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives

The primary factors involved for impacts to renewable energy are the amount of land available for renewable energy and the resources to develop renewable energy projects. Because renewable energy development proposals would be handled on a case-by-case basis throughout the entire District under each alternative, there is little difference in impact between each alternative. The identification of areas of the highest renewable energy development potential may encourage more renewable energy development than those alternatives that do not identify these areas.



Alternative A: Slightly less impact than Alternative E.

Alternative B: Slightly less impact than Alternative E.

Alternative C: Slightly greater impact than Alternative E, due to designations of wider utility corridors.

Alternative D: Much greater impact than Alternative E, because no new rights-of-way would be designated, nor would there be new land use authorizations.



### 4.28.14 Travel Management and Off-highway Vehicle Use

#### Geographic Area for Analysis

The geographic area for cumulative impacts to travel management and off-highway vehicle use is the area within the boundaries of the Ely District.

#### Impacts of the Proposed Action (Alternative E)

The cumulative impacts of travel management and off-highway vehicle use would occur through the degradation of transportation resources, and changes in designation and management of transportation resources. Under Alternative E recreational cross-country off-highway use would be eliminated. This would have a large impact on motorized recreational opportunities that would be partially offset by the creation of portions of special recreation management areas emphasizing motorized recreation on designated roads and trails. The more proactive approach to prioritizing road and trail designations through an updated transportation plan would have long term impacts to travel management.

#### Impacts of the Interrelated Projects

Impacts from interrelated projects would occur due to the paving of Kane Springs Road, the development of a road from Caliente to Mesquite, and an increase in demand for recreational off-highway vehicle use. New roads could improve accessibility while increased usage of roads and trails could increase maintenance needs and travel times.

#### Cumulative Impacts Conclusion

The elimination of cross-country off-highway vehicle use and the prioritization of road and trail designations through an updated transportation plan would have short and long term impacts to travel management, but would reduce off-highway vehicle use opportunities. The designation of 734,000 acres emphasizing motorized recreation on designated roads and trails within special recreation management areas would help to offset the elimination of areas open to cross-country off-highway vehicle use. The interrelated projects would have minimal effects on transportation planning and road and truck designations.

#### Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives

The primary factor involved for impacts to travel management and off-highway vehicle use is the number of roads and the amount of land available for travel and off-highway vehicle use.

Alternative A: Less impact than Alternative E.

Alternative B: Slightly less impact than Alternative E.



Alternative C: Less impact than Alternative E.

Alternative D: Greater impacts than Alternative E.



### 4.28.15 Recreation

#### Geographic Area for Analysis

The geographic area for cumulative impacts to recreation includes the Ely District and population centers outside the District that lie within a reasonable driving distance for recreational activities (e.g., Clark County).

#### Impacts of the Proposed Action (Alternative E)

The cumulative impacts to recreation could occur through the degradation of recreation resources, changes in designation and management of recreation resources, and changes in accessibility to and availability of recreation resources. The reduction in acreage of wild horse herd management areas would reduce the total area available for wild horse viewing. The designation of 18 new ACECs would provide management to protect resources in these areas, providing passive recreation opportunities. The elimination of areas open to cross-country off-highway vehicles use would reduce recreation opportunities, which would be partially offset by the designation of 734,000 acres emphasizing motorized recreation on designated roads and trails within special recreation management areas. The designation of nine special recreation management areas totaling almost 2.7 million acres and four motorcycle special recreation permit areas totaling approximately 656,000 acres would serve to focus recreation activities in areas that could be managed to protect relevant resources. Management activities could potentially reduce the number of outfitter and guide permits, thus affecting recreational hunting opportunities for non-resident hunters.

#### Impacts of the Interrelated Projects

Impacts from interrelated projects would occur due to an increase in demand for recreational off-highway vehicle use which would put more pressure on existing resources, and the rebuilding and expansion of reservoirs which would provide more recreational opportunities in the long term.

#### Cumulative Impacts Conclusion

Impacts to recreation under Alternative E include a reduction of areas offering motorized recreation opportunities, an increase in special recreation management areas, and a potential increase in wildlife, creating more viewing and hunting opportunities. While there would be less areas offering motorized recreation opportunities, the provision of areas specifically maintained for off-highway vehicles would help to offset this reduction. Interrelated projects would have a mixed impact on recreation. Rebuilding of dams and expansion of lakes could reduce recreation opportunities in the short term, while creating an overall increase in recreation opportunities in the long term. Increased population in the district and adjacent areas would lead to an increase in demand for recreational opportunities.

#### Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives

The primary factor involved for impacts to recreation is the quantity of land available for recreational activities, and the quality of recreational opportunities available upon that land.



Alternative A: Less impact than Alternative E.

Alternative B: Similar impact to Alternative E.

Alternative C: Slightly greater impact than Alternative E.

Alternative D: Greater impact than Alternative E due to a reduction of recreation opportunities.



### 4.28.16 Livestock Grazing

#### Geographic Area for Analysis

The cumulative effects area for livestock grazing is the entire Ely District, a few additional grazing allotments that cross the District boundary with some of these being administered by the Ely Field Office and others being administered by field offices in adjoining Districts, and the scattered locations throughout Nevada and Utah from which allotment permittees bring livestock to graze within the District.

#### Impacts of the Proposed Action (Alternative E)

Alternative E would have minimal direct effects on the current levels of grazing use or the area available for grazing, but would enhance the flexibility of the BLM to administer grazing permits to meet specific needs on a site specific basis, e.g., authorization of performance-based grazing and conversions of types of livestock. Livestock grazing would be indirectly affected by changes in several other resource programs. For example, the extensive vegetation treatments to restore vegetation resiliency would result in short-term reductions in forage and long-term increases in forage available for livestock grazing; a reduction in wild horse herd management areas generally would reduce conflicts with livestock; proposed land disposals would reduce the lands available for grazing; changes in management of off-highway vehicle use and recreation would tend to concentrate and redistribute potential conflicts with livestock grazing; while energy development, mineral extraction, and utility corridors would tend to create minor conflicts with livestock by reducing forage or imposing some constraint on livestock grazing.

#### Impacts of the Interrelated Projects

The primary past actions that have affected vegetation resources and thereby current livestock grazing in the District are historic mining activities and other human-caused surface disturbances, wildland fires and fire suppression, and historic grazing practices that have contributed to current ecological conditions. Surface disturbances have affected only a small percentage of the total area within the District; past grazing practices (including use by livestock, wild horses, and wildlife) and fire suppression, however, have been major contributors to current deteriorated vegetation conditions throughout the District. Partially due to these conditions, the spread of invasive and noxious weeds now threatens most of the ecological systems in the District.

Present actions affecting livestock grazing are mainly those that reduce the areas available for grazing or the level of forage production on those areas. Key examples include drought conditions, wildland fires, land disposal actions, and special designations that restrict grazing, the latter two being addressed herein as part of Alternative A in Section 4.16.

Key future actions (aside from Alternative E) anticipated to affect livestock grazing include potential restrictions associated with any additional species listings under the Endangered Species Act (a reduced or remote probability under Alternative E), and the same natural processes mentioned above including fire and drought. Each of these has the potential to either reduce areas available for grazing or the level of forage production on the available area.



### **Cumulative Impacts Conclusion**

The impacts of Alternative E and interrelated projects to livestock grazing would reduce forage for livestock in the short-term on any given treatment area during vegetation treatment activities and generally increase forage over the long-term as treated vegetation communities reach their potential productivity. Interrelated projects typically would reduce the area available for grazing. Overall the cumulative effects would enhance available forage on a long-term basis as the increasing forage productivity on treated areas offsets and later exceeds future incremental reductions associated with interrelated projects.

### **Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives**

On a short-term basis, the primary factor involved is the acreage of current livestock grazing area that would be temporarily removed for watershed treatment, fire rehabilitation, or temporary conflicts with other users. The primary long-term factors include permanent or long-range losses for land disposals, special designations, and habitat restrictions associated with potential additional species listed under the Endangered Species Act. Overall summary assessments of these combined factors follow below by alternative.

Alternative A: Less short-term, greater long-term impacts than Alternative E.

Alternative B: Greater short-term, greater long-term impacts than Alternative E.

Alternative C: Same short-term, greater long-term impacts than Alternative E.

Alternative D: Greater short-term, greater long-term impacts than Alternative E.



### 4.28.17 Woodland and Native Plant Products

#### Geographic Area for Analysis

The cumulative effects area for woodland and native plant products includes pinyon-juniper woodlands throughout east-central Nevada since both the demand for woodland products within the District and alternative supply sources involve areas extending beyond the District boundaries.

#### Impacts of the Proposed Action (Alternative E)

The direct effects of Alternative E would include removal of pinyon and juniper trees in a variety of situations to achieve the desired range of conditions for woodland sites (see Sections 2.5.5, 3.5, and 4.5). These actions may reduce the short-term production of pinyon pine nuts and other products in localized areas; however, the expected level of production for most woodland products in the District would continue to exceed the anticipated demand over the long term (see Section 4.17). Alternative E also would allow and encourage harvesting of a greater variety of woodland and native plant products within the District. Indirect effects of Alternative E on woodland and native plant products would include reduced disturbance by off-highway vehicles in woodland communities in large portions of the District and reduced risk of catastrophic fire events in overmature woodlands over the long term as vegetation treatments are used to achieve the desired range of conditions. Alternative E also would increase diversity of age classes within the various plant communities, ensuring sustained yield for future generations.

#### Impacts of the Interrelated Projects

The primary past actions that have affected production of woodland and native plant products are historic mining activities and other consumptive uses of fuelwood, various human-caused surface disturbances, wildland fires, and historic grazing practices. Surface disturbances and fires have affected only a small percentage of the total area within the District, but fuelwood harvest occurred over vast areas during the mid to late 1800s and early 1900s. Aggressive fire suppression has been a major contributor to current woodland conditions throughout the District. These past actions, along with climate fluctuations, have contributed to the expansion of pinyon pine and juniper into areas once dominated by sagebrush.

Present actions affecting vegetation composition and ecological health, and thereby production of woodland and native plant products, include livestock grazing, wild horse management, wildlife fire management, watershed management, and spread/control of invasive species. Current management in these areas has been addressed herein as parts of Alternative A in Section 4.17. To a lesser degree, other land uses such as harvest of woodland and native plant products, mineral extraction, rights-of-way, transportation, wildlife management, and recreation affect woodland conditions in localized areas. These also have been addressed as parts of Alternative A in Section 4.17. Various natural factors such as drought conditions and natural fire ignitions also affect woodlands and production of native plant products.

Key future actions, outside the Proposed Action, anticipated to affect woodland and native plant products include creation of additional rights-of-way, and the same natural processes mentioned above including fire,



drought, disease, and insect infestations. These have the potential to alter distribution of vegetation communities or contribute to further ecological deterioration with increased spread of invasive species and increased risk of major fire events. Most of these are actions directly addressed in this RMP rather than being cumulative effects contributed by external factors. However, spread of insect infestations such as the Ips beetle, which is now affecting sizeable areas throughout the western U.S., may dramatically alter the regional supplies of pinyon pine nuts. Thus, the District-wide production of pinyon pine nuts may be directly affected by local infestations, and demand may be affected as infestations occur in other portions of the region.

### **Cumulative Impacts Conclusion**

The impacts associated with Alternative E and interrelated projects would generally result in reduced acreage of dense, overmature woodlands, increased diversity of age classes within most woodland sites, healthier and more resilient overall woodland communities, and comparable or potentially increased annual production of woodland products on a sustained yield basis.

### **Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives**

On a short-term basis, the primary factors involved are those that affect the production rate and harvest of key woodland products such as fuelwood and pinyon pine nuts. The primary long-term factors include actions that would impact the distribution and resiliency on pinyon-juniper woodlands, such as natural wildfires and insect infestations.

Alternative A: Less short-term, greater long-term impacts than Alternative E.

Alternative B: Same short-term and long-term impacts as Alternative E.

Alternative C: Same short-term and greater long-term impacts as Alternative E.

Alternative D: Greater short-term, greater long-term impacts than Alternative E.



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### 4.28.18 Geology and Mineral Extraction

#### Geographic Area of Analysis

The geographic area for cumulative impacts to the minerals program is the area within the boundaries of the Ely District.

#### Impacts of the Proposed Action (Alternative E)

Under Alternative E exploration and development for the various categories of minerals would be conducted in accordance with established rules and regulations in a program that allows for reasonable access to lands and provides protection for other resources. The proposed programmatic stipulations for fluid minerals would not only provide for resource protection, but would streamline the administration of the fluid minerals leasing program.

#### Impacts of the Interrelated Projects

The impacts of most of the interrelated projects (as listed in **Table 4.18-2**) to minerals exploration and development would be minimal. However, conservation plans for sage grouse and species under the Endangered Species Act may affect mineral exploration and development. For instance, habitat constraints could affect economic recoverability or have the effect of completely precluding development of mineral resources.

#### Cumulative Impacts Conclusion

Impacts of Alternative E and certain interrelated projects on mineral exploration and development could be restrictive, with potential impacts coming primarily from interrelated projects involving endangered species recovery and protection.

#### Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives

The impacts of the Proposed Action (Alternative E) and species recovery programs on mineral resource exploration and development are potentially restrictive. Cumulative impacts of the other alternatives would be similar except for Alternative D under which cumulative impacts could be extremely restrictive.

Alternative A: The cumulative impacts of Alternative A are the same as Alternative E.

Alternative B: The cumulative impacts of Alternative B are the same as Alternative E.

Alternative C: The cumulative impacts of Alternative C are the same as Alternative E.

Alternative D: The cumulative impacts of Alternative D would be very restrictive to leasable and salable minerals because of the large amount of closed acreage that is proposed for those commodities in addition to the potential impact of species recovery and protection programs.



#### **4.28.19 Watershed Management**

##### **Geographic Area for Analysis**

The cumulative effects area for watershed management consists of the area within the Ely District boundary including land either administered by other agencies or privately owned, plus those portions of individual watersheds that cross the District boundaries into adjoining Districts.

##### **Impacts of the Proposed Action (Alternative E)**

Direct effects of Alternative E on watersheds would include the vegetation treatments described in Section 4.28.5. These actions would include treatments of approximately 6.2 million acres that do not currently meet the desired range of conditions in each vegetation community with a variety of methods to reestablish the desired vegetation composition, restore resiliency, and restore a more historical fire regime (see **Tables 2.4-1** and **4.5-1** and Sections 3.5 and 4.5). Under Alternative E, the additional forage produced on the treated areas, after meeting the Rangeland Health Standards, would be allocated to a combination of livestock, wild horses, and wildlife.

##### **Impacts of the Interrelated Projects**

The primary past actions that have affected current watershed condition and ecological health are historic mining activities and other human-caused surface disturbances, wildland fires, and historic grazing practices. Surface disturbances and fires have affected only a small percentage of the total area within the District. Past grazing management (including use by livestock, wild horses, and wildlife) and aggressive fire suppression, however, have been major contributors to current deteriorated ecological conditions throughout the District. Partially due to these conditions, the spread of invasive and noxious weeds now threatens most of the ecological systems in the District, accentuating the need for prompt and effective restoration treatment.

Present actions affecting watershed management are mainly those that affect the vegetation composition and ecological health of watersheds. Key examples include livestock grazing, wild horse management, drought conditions, wildland fires, and spread of invasive species. Several of these various actions have been addressed herein as part of Alternative A in Section 4.19. To a lesser degree, other land uses such as mineral extraction, rights-of-way, transportation, wildlife management, and recreation affect watershed conditions in selected areas. These also have been addressed in previous sections as part of Alternative A in Section 4.19.

Key future actions anticipated to affect watershed management include grazing by livestock and wild horses, creation of additional rights-of-way, potential restrictions associated with any additional species listings under the Endangered Species Act (a reduced or remote probability under Alternative E), and the same natural processes mentioned above including fire, drought, and climate change. These have the potential to contribute to further deterioration of watershed conditions or affect the timing and selection of



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watershed treatments available for restoration. The potential for such effects would diminish as increasingly greater portions of the District are restored to resilient vegetation conditions.

### Cumulative Impacts Conclusion

Most of the interrelated projects have individually localized, but cumulatively widespread, effects on ecological health and watershed function, depending on the nature and areal extent of disturbances involved. On a short-term basis, Alternative E would tend to be additive to such impacts, but on a long-term basis, the vegetation improvement associated with the treatments should more than offset the effects of the interrelated projects. This expectation of improved conditions, however, could be delayed or reduced by extended periods of drought, major insect infestations, or disease outbreaks. In other cases, insects and disease could help in meeting management goals.

### Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives

On a short-term basis, the primary factors involved are those that affect the current condition of watersheds or constrain the selection of treatments and resultant success for restoration of deteriorated sites. The primary long-term factors include actions that would impact the maintenance of resiliency on restored areas, such as grazing by livestock and wild horses.

Alternative A: Greater short-term, greater long-term impacts than Alternative E.

Alternative B: Same short-term, same long-term impacts as Alternative E.

Alternative C: Same short-term, greater long-term impacts than Alternative E.

Alternative D: Greater short-term, greater long-term impacts than Alternative E.

#### ***RMP Management Focus***

*The restoration and maintenance of healthy ecological systems within watersheds is a primary focus for the future management of the Ely District. Healthy ecological systems are geographically diverse and change over time. They are compatible with soil potential and are resilient to disturbance.*

*Resources and resource uses will be managed to restore or maintain ecological health. Certain resource management changes and active treatments may need to be implemented, in portions of watersheds, to accomplish this objective. Adaptive management will be pursued to avoid deteriorating conditions favoring invasive plants and catastrophic fires. Any projects will be implemented so as to result in a mosaic of vegetation within a watershed.*

*In the long term, natural disturbance (such as drought or fire) will occur and fewer treatments will be needed to maintain ecological health. The result will be a variety of vegetation phases within a watershed, which will provide diverse, healthy conditions for future generations.*



#### 4.28.20 Fire Management

##### Geographic Area for Analysis

The cumulative effects area for fire management includes the Ely District and surrounding jurisdictions that also manage fires, such as other BLM Field Offices and National Forest Ranger Districts.

##### Impacts of the Proposed Action (Alternative E)

The primary direct effect of Alternative E would be substantially greater use of prescribed fire and managed natural fires, along with herbicides and mechanical treatments, as vegetation management tools in the vegetation treatment process. Since more fires would be involved, there is a greater short-term risk of a prescribed fire escaping from control, but the effects of vegetation treatments, including the use of fire, would reduce the risk of catastrophic fire events on a long-term basis. Increased use of prescribed fire and other vegetation treatments in wildland urban interface areas would reduce the current fuel loading of these areas and the associated risks of larger fires that would jeopardize human safety and property. Indirect effects of the proposed fire management actions would include short-term reductions in forage and habitat for wildlife, wild horses, and livestock on localized areas where fire is used in vegetation treatments. Increased use of fires is expected to result in more frequent smoke emissions spread over smaller areas and over shorter time periods when compared to the effects of larger wildfires. As with the use of other vegetation treatment tools, the long-term effects would be more forage and habitat for these same resource users.

##### Impacts of the Interrelated Projects

The primary factors that have affected fire management (and fire history) within the District are the same factors that have affected vegetation and ecological health including historic mining activities, historic grazing practices, historic fuelwood harvest, past fire suppression efforts, and expansion of weedy annual species such as cheatgrass. Surface disturbances and fires have affected only a small percentage of the total area within the District, a smaller percentage than would have been affected in the absence of fire suppression efforts. Past grazing practices (including use by livestock, wild horses, and wildlife) and fire suppression efforts have been major contributors to current deteriorated ecological conditions throughout the District. Past fire suppression activities have resulted in dense or overmature stands of pinyon-juniper and sagebrush in numerous areas with accumulation of heavy fuels in many woodland areas. Partially due to these factors plus drought and other climatic changes, the spread of invasive and noxious weeds has provided an abundance of fine fast burning (flashy) fuels across much of the region and contributed to a shorter fire cycle in the affected areas.

Present management actions and natural events affecting fire management include primarily factors addressed herein as parts of Alternative A in Section 4.20 that provide potential ignition sources (e.g., recreation, off-highway vehicle use, and mineral development) and factors that affect fuel supply (e.g., vegetation treatments, livestock grazing, wild horse management, harvest of woodland products,



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watershed management, and natural events such as spread of invasive species). Interaction of fire management with actions external to the public lands of the District primarily involves the presence of potential ignition sources on adjoining properties outside the BLM's jurisdiction. For example, wildland fires commonly originate along highways and railroad rights-of-way or from human activities on residential and commercial properties adjoining public lands. Various natural factors such as drought conditions and thunderstorms also affect fire management.

Key future actions (aside from Alternative E) anticipated to affect fire management include construction activities, recreational uses, vehicular traffic, industrial and residential development adjacent to public lands, and the same natural processes mentioned above including drought, climate change, and continued spread of invasive species.

### **Cumulative Impacts Conclusion**

The cumulative impacts on fire management involve the effects of Alternative E (increased use of prescribed fires to achieve desired range of conditions for vegetation and greater flexibility in responding to accidental or natural ignitions) offsetting the increased frequency of accidental ignitions expected from the escalating use of the planning area for such activities as recreation, industrial development, and off-highway vehicle use.

### **Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives**

In this section, the alternatives are compared on the basis of how they affect overall risks associated with fire and the ability of the BLM to use natural and prescribed fire as a tool in achieving the stated vegetation management goals. In general, these comparisons are dependent on factors addressed within Section 4.20, Fire Management, and are not driven by external factors associated with a cumulative analysis.

Alternative A: The continuing increase in both flashy and heavy fuels would result in greater short-term and long-term impacts than Alternative E.

Alternative B: Similar short-term and long-term impacts as Alternative E.

Alternative C: Short-term impacts may be similar to or greater than Alternative E; long-term impacts would be greater than Alternative E.

Alternative D: Both short-term and long-term impacts would be greater than Alternative E.



#### 4.28.21 Noxious and Invasive Weed Management

##### Geographic Area for Analysis

The cumulative effects area for noxious and invasive weed management includes the Ely District plus surrounding areas that could be the source of weed seeds transported by motor vehicles, construction vehicles, off-highway vehicles, and railroads.

##### Impacts of the Proposed Action (Alternative E)

Direct effects of Alternative E on management of invasive and noxious weeds would include widespread treatment of weed populations in association with vegetation treatments to achieve the desired range of conditions within various vegetation communities. Treated areas at or near these desired conditions would have a lower probability for invasion and spread of invasive or noxious weed species. These management activities would improve vegetation resiliency in the long term, but do involve some short-term risk of greater weed spread in the event of treatment failure in drought years or due to other circumstances. Indirect effects of Alternative E include the reduction in disturbance and seed spread from uncontrolled widespread use of off-highway vehicles, the improvement of vegetation communities in wild horse herd management areas currently unable to support existing populations, and improved protection of vulnerable sites such as riparian areas.

##### Impacts of the Interrelated Projects

The primary past actions that have affected noxious and invasive weed management are those factors that have contributed to the introduction and spread of these weed species throughout the District. Key actions include historic mining activities, road construction, vehicle traffic, local agriculture, other human-caused surface disturbances, wildland fires, historic grazing practices, and drought. Although surface disturbances and fires have affected only a small percentage of the total area within the District, they provided fresh barren areas for colonization by invasive species. Past grazing practices (including use by wild horses and wildlife) and aggressive fire suppression have been major contributors to current deteriorated vegetation conditions throughout the District and have effectively reduced the ability of native perennial species to compete against weedy species invading native vegetation communities. Agricultural practices, highway and railway traffic, livestock movement, and recreational activities have been common vectors helping to introduce and spread propagules (seeds, spores, etc.) of invasive species. Because of these various factors, the spread of invasive and noxious weeds now threatens most of the ecological systems in the District, accentuating the need for prompt and effective restoration treatment.

Present actions affecting noxious and invasive weed management include agriculture, livestock grazing, wild horse management, mineral development and other construction activities, drought conditions, wildland fires, insect infestations, vegetation/watershed treatments, land disposal actions, recreation, highway traffic, and off-highway vehicle use. Several of these various actions have been addressed in Alternative A in Section 4.21 through specific types of management actions. Others, however, are not subject to BLM



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jurisdiction based on where they occur (often on adjoining private lands) or the nature of the activity (e.g., highway traffic, drought, and insect infestations).

Key future actions anticipated to affect noxious and invasive weed management include the same array listed above plus additional rights-of-way and land disposals, all addressed as parts of Alternative E.

### **Cumulative Impacts Conclusion**

Alternative E would work to control the spread and reduce the occurrence of invasive and noxious weed species in the District. At this time, however, it is undetermined whether the rate of vegetation treatment and improvement toward the desired range of conditions would be adequate to offset the recently increasing rate of introduction and spread of invasive and noxious species, some of which is associated with interrelated past, present, and future projects.

### **Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives**

On a short-term basis, the primary factors involved are those that affect the introduction and spread of invasive species, contribute to loss of native vegetation diversity and vigor, or constrain the selection of treatments and resultant success for restoration of deteriorated sites. The primary long-term factors include actions that would impact the maintenance of resiliency on restored areas, such as grazing by livestock and wild horses.

Alternative A: Same short-term, greater long-term impacts than Alternative E.

Alternative B: Same short-term, lesser long-term impacts than Alternative E.

Alternative C: Same short-term, greater long-term impacts than Alternative E.

Alternative D: Greater short-term, greater long-term impacts than Alternative E.



#### **4.28.22 Special Designations**

##### **Geographic Area for Analysis**

The geographic area for cumulative impacts to special designations is the area within the boundaries of the Ely District.

##### **Impacts of the Proposed Action (Alternative E)**

Under Alternative E, 18 new ACECs and 2 new back-country byways would be designated. Twelve of these new ACECs would be reclassifications of previous special designation areas. Eight areas totaling 2,155 acres would be dropped from special designation, which would have minimal impact as management prescriptions under Alternative E have been determined to adequately protect the resource values associated with these areas. There would be a small reduction, approximately 2,200 acres, in areas segregated from disposal.

##### **Impacts of the Interrelated Projects**

Cumulative impacts to special designations could occur through the degradation of special designation areas, changes in designation of special designation areas, changes in access to special designation areas, and changes in management prescriptions for special designation areas. Impacts from interrelated projects would occur due to an increase in access to the desert tortoise ACECs in the southeastern part of the District through the development of a road from Caliente to Mesquite, and the paving of the Kane Springs Road. This could potentially result in impacts in those areas by degrading desert tortoise habitat and potentially increasing desert tortoise mortality through collisions with vehicles.

##### **Cumulative Impacts Conclusion**

Impacts to special designations under Alternative E would be an increase in areas managed as ACECs, providing more effective protection of resources, and the creation of new back-country byways. Road development and improvements for interrelated projects could have impacts to desert tortoise populations in the southeastern portion of the District, degrading desert tortoise habitat and potentially increasing desert tortoise mortality through collisions with vehicles.

##### **Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives**

The primary factor involved for impacts to special designations is the quantity of land given special designations, and the management prescriptions for these lands.

Alternative A: Less impact than Alternative E.

Alternative B: Similar impact to Alternative E.



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Alternative C: Slightly greater impact than Alternative E.

Alternative D: Less impact than Alternative E.



### 4.28.23 Economic Conditions

#### Geographic Area of Analysis

For cumulative economic and social effects, the external boundaries of the Ely District and surrounding communities extending as far as Las Vegas constitute the relevant geographic area of analysis. This area would capture the preponderance of direct and indirect economic impacts associated with the interrelated projects located within and adjacent to the District's boundaries and the management actions associated with the RMP. Many of the demands and pressures affecting the Ely Field Office originate outside of the District and, hence, are captured in this cumulative analysis area.

#### Impacts of the Proposed Action (Alternative E)

Alternative E would result in minor, long-term impacts in the form of increased additional local employment opportunities, personal income, sales for local businesses, and tax revenues for local governments. Some of the gains would arise as a result of the increased funding for restoration, while other gains would accrue over the long term, as the level of developed and organized recreation and woodland commodity use increases in response to ecological health restoration. Resident households associated with the incremental jobs would spawn demand for housing along with visitor populations, and demand on local public facilities and services.

#### Impacts of the Interrelated Projects

Virtually all the identified interrelated past, present, and reasonably foreseeable projects have actual or potential economic and social consequences. Such consequences manifest themselves in the following contexts:

- Capital investments associated with past and present projects result in the development of residential, commercial, and public infrastructure with economic lives extending beyond that of the interrelated project itself.
- Short- and long-term influences of activities in one period that establish land use patterns affecting economic and social conditions in subsequent periods. For example, once built, highways and state parks can stimulate recurring local economic stimulus related to recreational visitors, tourists, and other travelers.
- Private real estate speculation and development and public sector land use, facility, and service planning initiatives prompted by prospective future activities, whether real or merely suggested by information such as the mapping of high potential mineral development areas.
- Effects tied to actions, activities, and projects located outside the Ely District, but having indirect connections to resources within the District. Examples of such actions include past, current, and



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potential future Department of Defense and Department of Energy activities on federal lands adjacent to the Ely District, accessed via highway and railroad connections in the District.

- Reasonably foreseeable actions can generate subtle economic impacts in the present, with more tangible economic effects arising as a project transitions from concept to reality. Cumulative effects are shaped not just by the characteristics of the specific project, but also by other activities occurring in the same timeframe. In fact, the degree of overlap in schedules and relative scales of interrelated projects are critical factors influencing cumulative impacts. The timing aspects of the majority of the interrelated projects is not available to include in this discussion.
- Temporary, short-term and long-term effects on local employment, population, housing demand, community facilities and services, fiscal conditions, and social values and attitudes towards public land management would be expected.

The recent reopening of the Robinson mine, other mineral development projects, changes in agricultural development, the Yucca Mountain Nuclear Repository, and the White Pine Energy Station are the projects having the highest potential for short and long-term economic and social effects in the District. The short-term effects would occur during initial project start-up and construction, with long-term effects associated with the ongoing operations. Water development projects also could have significant long-term consequences depending upon the timing and use/application of the subsequent water production.

The reasonably foreseeable projects with potential long-term employment effects tend to be somewhat geographically clustered in the northern and southern portions of the District. Hence, associated economic and social impacts would tend to be concentrated in the Ely and Caliente areas, or in new development areas such as Coyote Springs or involved in the Lincoln County Land Act. Of themselves, large-scale mineral and energy development projects, the Yucca Mountain – Caliente rail line, and new land development activities are those with the highest potential to be significant. That potential increases if multiple projects are simultaneously active. At the same time, the possibility exists for some offsetting impacts; for instance, the expansion of one mine or startup of an energy development project as another mine is closing, thereby dampening the impacts associated with the former.

**Cumulative Impacts.** Because of the factors described above, almost all of the interrelated projects have actual or potential cumulative economic and social impacts when considered in conjunction with the Proposed Action. Potential cumulative economic effects associated with Alternative E include the linkages between economic and population growth in Clark County and recreation use, local water development, and demands for land disposal, energy production, and transmission capacity, and residential development within the District. These uses and demands create pressures on local agricultural operations through indirect impacts on grazing and demand for developable land that could trigger contractions in the local agricultural sector and its economic contributions to the local economy. The increase in BLM funding for watershed restoration, if it coincides with a resurgence in mining and other energy development, could create short-term synergistic impacts on the local labor market, housing, and community service conditions. The cumulative effects of these influences accentuate the on-going transition between a commodity-based and more service-based economy.



Another series of cumulative effects involves land use and management of public lands in and around the District by multiple governmental agencies. BLM and U.S. Forest Service management of vast tracts of land and resources in the region generate economic effects that vary over time, but are relatively consistent from year-to-year during the short-term. However, activities at the Nellis Air Force Base flight range and the Nevada Test Site, including the potential construction at the Yucca Mountain Nuclear Repository and transportation network, are known to fluctuate and could dramatically alter the District's economic setting over the long-term. A decision to proceed with the Yucca Mountain Nuclear Repository could increase demand for land disposal, water development, and recreation and commodity use on the District, potentially affecting the Field Office's management of the District. Completion of the Lincoln County Land Act sale and subsequent new development would generate cumulative social and economic effects in nearby Mesquite and Clark County. Employment and population growth also could accompany the project, with the scale and timing dependent on the transportation mode and access routes selected. The development-related economic and social impacts would be significant.

Cumulative economic impacts would arise in conjunction with Congressionally mandated land and realty actions, as they could give rise to future economic development activities, impact future management and watershed restoration priorities within the District, as well as the locations and levels of use on public lands, all of which could indirectly affect local economic conditions.

Potential cumulative economic impacts arising from the other projects could create temporary and short-term economic fluctuations, varying in scale, but similar to those characterizing the region's recent history. For example, mineral resource development in the northern portion of the District could result in population, economic, and social effects to nearby communities outside the District. Most, if not all, of those communities already host businesses and residents associated with mineral development elsewhere in eastern Nevada. As such, the changes may be viewed more in the context of normal or typical events and less as fundamental changes in the region's economic environment.

The cumulative economic effects described above have corollary cumulative effects in terms of social and community well-being. In the case of past actions, the cumulative effects manifest themselves as physical vestiges of the activity, as well as in present social conditions and attitudes. Historical and existing social linkages bind together generations of past, current, and future residents of the region. Past and present residents have contributed to the formation of local governance, community service capabilities, and local organizations and institutions that function today. Development pressures from outside the region may reshape and influence the established social structure and order within the District. Given the rural nature of the District and the attendant low population base, the opportunities to effect change or address issues within state and federal government arenas may be constrained. The net cumulative effect of these factors maybe a diminished sense of self-determination and local control that characterizes much of the rural West. Cumulative impacts on social conditions associated with the long-term land development activities have the potential to be significant.



### Cumulative Impacts Conclusion

Several of the interrelated projects pose a potential for generating significant impacts on economic and social conditions in portions of, or across much of the Ely District. The greatest likelihood for significant impacts arises in the context of potential long-term changes associated with major future land development activities in southern Lincoln County, the proposed Yucca Mountain Nuclear Repository, water development and pipeline proposals seeking changes in the location and type of use of surface and groundwater resources in the region, and the White Pine Energy Station. The agency preferred alternative, and any of the alternatives thereto, would incrementally contribute to those impacts in a cumulative sense, if for no other reason than that several of them would directly or incidentally involve public lands, for utility corridors, for instance. Although the duration, timing, and extent of the overall cumulative effects is indeterminate based on current information, the potential for significant impacts, including short-term impacts, increases if development of two or more of the interrelated projects were to occur concurrently.

### Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives

The potential cumulative economic and social effects do not vary appreciably between the RMP management alternatives, because the scale and timing of the interrelated projects, many of which are outside to the region, have few direct linkages to the key local economic parameters affected by the management alternatives. From a cumulative effects perspective, a key issue is whether differences in the alternatives increase or diminish the likelihood of a present action maintaining its current status or of a reasonably foreseeable future action occurring or not occurring. The potential for cumulative social effects does not vary appreciably between the alternatives because the most pronounced influences affecting these impacts are outside the region.

Alternative A: Additional activity in the region associated with the interrelated projects could accelerate the onset of subsequent use restrictions and economic impacts triggered by declining ecological health.

Alternative B: Potential cumulative effects under Alternative B would include substantial economic impacts to affected ranchers with allotment permits in the areas closed for bighorn sheep and desert tortoise habitat.

Alternative C: Corridor management policies under this alternative may increase the likelihood of one or more of the interrelated energy projects occurring, with resulting minor increase in cumulative effects on employment, income, and other economic activity. Land use authorization policies may interact with the Yucca Mountain Nuclear Repository and aid other projects to allow more economic growth and community expansion over time.

Alternative D: The no net loss of public lands provision under Alternative D could result in cumulative interactions with other interrelated projects. However, the timing, location, and scale of the impacts are unknown. The removal of livestock grazing throughout the District would result in substantial economic impacts within the District and to surrounding areas where some of the affected ranchers may reside.



**4.28.24 Social Conditions**

See the preceding section on economic conditions.



### 4.28.25 American Indian Issues

American Indian issues identified through scoping (land disposals, access to sacred sites, pinyon pine nut harvesting, tribal outfitter guide service) and comments expressed by representatives of American Indian groups participating as cooperators in the RMP process were examined in relation to Alternative E. No cumulative impacts from interrelated projects were identified; however, natural processes such as drought, fire, and insect destruction of pinyon pines, would have an impact on future pine nut harvests.



**4.28.26 Environmental Justice**

Following the definition for cumulative impacts, an impact must result from BLM management direction before a cumulative impact would occur. Since no environmental justice issues have been identified in relation to Alternative E, no cumulative impacts are anticipated.



### 4.28.27 Health and Safety

#### Geographic Area for Analysis

The cumulative effects area for health and safety includes all areas within the Ely District boundary plus adjoining areas and communities potentially affected by atmospheric emissions, hazardous materials spills, or wildfires originating within the District.

#### Impacts of the Proposed Action (Alternative E)

Direct effects of Alternative E would not differ from the other alternatives with respect to health and safety, in that activities under this alternative would be conducted in accordance with applicable regulations and BLM policy regarding health and safety and protection of personal property. Thus, there are no program-specific impacts for health and safety under Alternative E. However, actions from other resource programs such as vegetation and fire management would have substantial effect on health and safety issues. Vegetation treatments, including fuel reduction in wildland urban interface areas, and the fire management plans of Alternative E would reduce the long-term risk of large-scale fires and the risk of personal injuries and destruction of personal property associated with wildfires.

#### Impacts of the Interrelated Projects

The primary past actions that contribute to health and safety issues within the District are those that contribute to current fire hazards. Numerous other past actions, such as mining and smelting operations, contributed to previous health and safety issues (mine subsidence and smelter emissions) that no longer persist as major public land issues in the area. Past actions contributing to current fire hazard conditions include historic grazing practices, aggressive fire suppression, and various surface disturbances that have either facilitated expansion of annual weed species or lead to accumulation of unusually heavy fuel loads in various vegetation types. Other activities, such as development of roads, railroads, other rights-of-way, agricultural practices, and mineral extraction have contributed to the presence of widespread human activities that constitute potential ignition sources for wildfires.

Present and future actions potentially contributing to the current and future fire hazards include almost all human activities occurring on the public lands, particularly those that involve construction equipment and activity, traffic and vehicle use, and recreation involving off-highway vehicle use. Thus, almost any of the interrelated projects involving human activity may be a contributing factor in terms of providing an ignition source.

#### Cumulative Impacts Conclusion

Alternative E would reduce the long term risk of large-scale fires and the risk of personal injuries and destruction of personal property associated with wildfires, largely offsetting the anticipated increases in wildfire risk arising from various interrelated projects.



**Variation in Cumulative Impacts Between the Preferred Alternative and Other Alternatives**

The primary factors involved in health and safety issues related to wildfires include the following (listed from short term to longer term): 1) suppression of wildland fires as necessary to protect persons and property, 2) the prompt and orderly reduction in fuel loading around vulnerable communities (i.e., wildland urban interface management), and 3) reduction of excessive fuel loadings throughout the District so that a more natural fire regime may be reestablished with resilient vegetation communities.

Alternative A: Greater short-term, greater long-term impacts than Alternative E.

Alternative B: Same short-term, same long-term impacts as Alternative E.

Alternative C: Same short-term, greater long-term impacts than Alternative E.

Alternative D: Greater short-term, greater long-term impacts than Alternative E.



4.28.28      Summary of Cumulative Impacts

**Table 4.28-3**, which follows, presents a summary of the cumulative impacts to each resource program for Alternative E (Proposed Action). The detailed discussion of cumulative impacts begins in Section 4.28.2.



**Table 4.28-3**  
**Cumulative Impacts of the Proposed Action**

<b>CLIMATE AND AIR QUALITY</b>	Cumulative impacts include those caused by sources and activities associated directly with Alternative E and those caused by interrelated projects that have occurred historically, projects that are currently underway, and those that might reasonably occur in the future. Air resources in the District are mainly affected by mining and vegetation management/fire management practices. Regulatory decisions related to industrial development and mining would prevent significant air quality degradation by applying mitigation measures on a case-by-case basis. Two potential electrical generating power projects would affect air quality in the region if constructed. Permitting requirements of the Nevada Division of Environmental Protection and the U.S. Environmental Protection Agency would require modern control technology to limit emissions and impacts from these potential sources. Fire management treatments would include in-depth planning and analysis of potential incident and cumulative air quality impacts to reduce emissions associated with fires. Projected cumulative impacts are of such a nature that the District should be able to meet all applicable local, state, Tribal, and National Ambient Air Quality Standards under the Clean Air Act (as amended), and prevent significant deterioration of air quality within the Ely District from all direct and authorized actions.
<b>WATER RESOURCES</b>	Cumulative impacts of Alternative E would be minimized over the long term by extensive vegetation management and administration of other land uses that would consider a balanced ecosystem approach. Salinity inputs to the Colorado River system would be reduced over time. Short-term increases in runoff, soil erosion, and related sedimentation may occur on those areas where vegetation treatments occur. Interrelated projects would have the potential to create impacts on both surface and groundwater resources through additional erosion and sedimentation as a result of land disturbance, further consumption of available water resources, and additional releases of undesirable water quality constituents (e.g., industrial chemicals, treated domestic effluent) into receiving waters. The enhanced vegetation resiliency resulting from Alternative E should help offset the effects of the interrelated projects on water resources.
<b>SOIL RESOURCES</b>	Cumulative impacts of Alternative E and interrelated projects would involve a short-term increase of erosion and sedimentation, with accompanying reduction in soil productivity, when the activities are initially undertaken. Extensive vegetation treatment on the District would, in time, result in substantial reduction of erosion and sedimentation. Similarly, soil productivity would increase over the long term as a result of vegetation treatments. Impacts from interrelated project development within the District would result in permanent removal or alteration of soil resources in specific areas (such as project footprints or some riparian/wetland areas). Regulatory programs (including permit approval and monitoring processes), and the implementation of best management practices and mitigation measures, would reduce the degree of overall erosion and sedimentation impacts. Soil productivity would be lost in the comparatively smaller areas affected by interrelated projects, but would improve over widespread areas with successful vegetation restoration.
<b>VEGETATION</b>	The actions related to Alternative E would enhance vegetation resiliency on a long-term basis, although some elements of the alternative would contribute to temporary loss of vegetation and potential spread of invasive species. Most of the interrelated projects have produced or would result in the removal of native vegetation and potential spread of invasive species, either through physical disturbance or alteration of vegetation communities. The enhanced vegetation resiliency resulting from Alternative E should offset a large portion of the past and potential future disturbance effects from interrelated projects.
<b>FISH AND WILDLIFE</b>	
<b>Aquatic Habitat and Fisheries</b>	The cumulative effects of interrelated projects in combination with program-specific management under Alternative E would generally improve maintenance and quality of fish habitat in the long term as restoration efforts improve both upland and riparian habitat conditions. This habitat improvement would tend to offset continued habitat losses and damage resulting from various interrelated projects including potential groundwater withdrawal.
<b>Wildlife</b>	The actions related to Alternative E would improve wildlife habitat conditions on the watershed level and landscape level in the short and long term. However, the interrelated projects either have produced or would result in direct wildlife mortality, displacement of wildlife, habitat loss or alteration, and increased habitat fragmentation. The habitat improvement resulting from the vegetation restoration treatments should offset a large portion of the past and potential future habitat losses and damage resulting from interrelated projects.



Table 4.28-3 (Continued)

<b>SPECIAL STATUS SPECIES</b>
<b>Plant Species</b>
The impacts related to Alternative E would have minimal effect on the Ute ladies'-tresses orchid, Sunnyside green gentian, and other special status plants on an overall basis. Most of the interrelated projects have produced or would produce minimal effects to special status plants, either through physical disturbance or alteration of vegetation communities. The improved knowledge base and potential mitigation measures related to Alternative E should offset a large portion of the past and potential future adverse effects from interrelated projects.
<b>Aquatic Species</b>
In spite of a management emphasis in Alternative E on protecting habitat for sensitive aquatic species, surface disturbance activities could result in localized water quality changes due to sedimentation or runoff contaminants, and habitat alteration or loss. Several programs such as vegetation restoration and weed management (i.e., tamarisk removal) could increase stream flows and spring discharges. Several of the interrelated projects could result in changes to surface water quantity in various streams or springs (e.g., groundwater withdrawal). In the long term, vegetation restoration could reduce stream flows originating from surface runoff, but could locally increase stream base flows and spring discharges. Other interrelated actions could combine with these water quantity changes to affect habitat for sensitive species. The cumulative effects of interrelated projects in combination with program-specific management under Alternative E would result in impacts on sensitive fish species habitat due to surface disturbance in watersheds, but this would be balanced by an increased rate of maintenance and restoration of habitat for sensitive fish species.
<b>Wildlife Species</b>
The impacts related to Alternative E would improve special status species habitat conditions on the watershed level and landscape level in the long term. However, the interrelated projects either have produced or would continue to result in direct special status species mortality, displacement of individuals, habitat loss or alteration, and increased habitat fragmentation. The special status species habitat improvement resulting from Alternative E should offset a large portion of the past and potential future habitat losses and damage resulting from interrelated projects.
<b>WILD HORSES</b>
The impacts related to Alternative E generally would improve habitat for wild horse herds on a long-term basis while many of the potential impacts associated with interrelated projects would reduce habitat, but typically to a lesser degree. Thus, the overall cumulative effects would be general improvement in the habitat necessary for long-term herd health and viability.
<b>CULTURAL RESOURCES</b>
There would be a high level of protection of cultural resources under Alternative E (overall decrease in lands available to off-highway vehicle use and livestock/wild horse grazing and the designation of ACECs to protect cultural resources) offsetting the expected increase in visitor and recreation use in the District. Thus, the overall cumulative effects would be negligible.
<b>PALEONTOLOGICAL RESOURCES</b>
There would be a high level of protection of paleontological resources under Alternative E (overall decrease in lands available to off-highway vehicle use and mineral development, and a registration system for fossil collecting) offsetting the expected increase in visitor and recreation use in the District. Thus, the overall cumulative effects would be negligible.
<b>VISUAL RESOURCES</b>
Under Alternative E, impacts to visual resources would be minimal, those impacts mainly being from surface disturbances associated with the vegetation treatments, and the reduction in surface disturbances associated with the elimination of cross-country off-highway vehicle use and the co-location of utility rights-of-way and communication sites. Some interrelated projects would result in surface disturbances, increased air emissions, and local visual impacts.
<b>LANDS AND REALTY</b>
Cumulative impacts to the management of lands and realty would be relatively minor and would occur as a result of new avoidance and exclusion areas and management direction encouraging co-location of utility rights-of-way and communication sites. Interrelated projects could increase pressure for development and create a higher demand for developable lands in the planning area.
<b>RENEWABLE ENERGY</b>
Interrelated power plant and transmission line projects could create better access to electrical transmission lines. Interrelated power plants, water development, and residential development projects could impact renewable energy development through the use of water that could otherwise be used for development of concentrated solar power.



Table 4.28-3 (Continued)

<b>TRAVEL MANAGEMENT AND OFF-HIGHWAY VEHICLE USE</b>	
The elimination of cross-country off-highway vehicle use and the prioritization of road and trail designations through an updated transportation plan would have short and long term impacts to travel management, but would reduce off-highway vehicle use opportunities. The designation of 734,000 acres emphasizing motorized recreation on designated roads and trails within special recreation management areas would help to offset the elimination of areas open to cross-country off-highway vehicle use. The interrelated projects would have minimal effects on transportation planning and road and truck designations.	
<b>RECREATION</b>	
Impacts to recreation under Alternative E include a reduction of areas offering motorized recreation opportunities, an increase in special recreation management areas, and a potential increase in wildlife, creating more viewing and hunting opportunities. While there would be less areas offering motorized recreation opportunities, the provision of areas specifically maintained for off-highway vehicles would help to offset this reduction. Interrelated projects would have a mixed impact on recreation. Rebuilding of dams and expansion of lakes could reduce recreation opportunities in the short term, while creating an overall increase in recreation opportunities in the long term. Increased population in the district and adjacent areas would lead to an increase in demand for recreational opportunities.	
<b>LIVESTOCK GRAZING</b>	
The impacts of Alternative E and interrelated projects to livestock grazing would reduce forage for livestock in the short-term on any given treatment area during vegetation treatment activities and generally increase forage over the long-term as treated vegetation communities reach their potential productivity. Interrelated projects typically would reduce the area available for grazing. Overall the cumulative effects would enhance available forage on a long-term basis as the increasing forage productivity on treated areas offsets and later exceeds future incremental reductions associated with interrelated projects.	
<b>WOODLAND AND NATIVE PLANT PRODUCTS</b>	
The impacts associated with Alternative E and interrelated projects would generally result in reduced acreage of dense, overmature woodlands, increased diversity of age classes within most woodland sites, healthier and more resilient overall woodland communities, and comparable or potentially increased annual production of woodland products on a sustained yield basis.	
<b>GEOLOGY AND MINERAL EXTRACTION</b>	
Impacts of Alternative E and certain interrelated projects on mineral exploration and development could be restrictive, with potential impacts coming primarily from interrelated projects involving endangered species recovery and protection.	
<b>WATERSHED MANAGEMENT</b>	
Most of the interrelated projects have individually localized, but cumulatively widespread, effects on ecological health and watershed function, depending on the nature and areal extent of disturbances involved. On a short-term basis, Alternative E would tend to be additive to such impacts, but on a long-term basis, the vegetation improvement associated with the treatments should more than offset the effects of the interrelated projects. This expectation of improved conditions, however, could be delayed or reduced by extended periods of drought, major insect infestations, or disease outbreaks. In other cases, insects and disease could help in meeting management goals.	
<b>FIRE MANAGEMENT</b>	
The cumulative impacts on fire management involve the effects of Alternative E (increased use of prescribed fires to achieve desired range of conditions for vegetation and greater flexibility in responding to accidental or natural ignitions) offsetting the increased frequency of accidental ignitions expected from the escalating use of the planning area for such activities as recreation, industrial development, and off-highway vehicle use.	
<b>NOXIOUS AND INVASIVE WEED MANAGEMENT</b>	
Alternative E would work to control the spread and reduce the occurrence of invasive and noxious weed species in the District. At this time, however, it is undetermined whether the rate of vegetation treatment and improvement toward the desired range of conditions would be adequate to offset the recently increasing rate of introduction and spread of invasive and noxious species, some of which is associated with interrelated past, present, and future projects.	
<b>SPECIAL DESIGNATIONS</b>	
Impacts to special designations under Alternative E would be an increase in areas managed as ACECs, providing more effective protection of resources, and the creation of new back-country byways. Road development and improvements for interrelated projects could have impacts to desert tortoise populations in the southeastern portion of the District, degrading desert tortoise habitat and potentially increasing desert tortoise mortality through collisions with vehicles.	



Table 4.28-3 (Continued)

<b>ECONOMIC CONDITIONS</b>
Several of the interrelated projects pose a potential for generating significant impacts on economic and social conditions in portions of, or across much of the Ely District. The greatest likelihood for significant impacts arises in the context of potential long-term changes associated with major future land development activities in southern Lincoln County, the proposed Yucca Mountain Nuclear Repository, water development and pipeline proposals seeking changes in the location and type of use of surface and groundwater resources in the region, and the White Pine Energy Station. The agency preferred alternative, and any of the alternatives thereto, would incrementally contribute to those impacts in a cumulative sense, if for no other reason than that several of them would directly or incidentally involve public lands, for utility corridors, for instance. Although the duration, timing, and extent of the overall cumulative effects is indeterminate based on current information, the potential for significant impacts, including short-term impacts, increases if development of two or more of the interrelated projects were to occur concurrently.
<b>SOCIAL CONDITIONS</b>
See economic conditions.
<b>AMERICAN INDIAN ISSUES</b>
Cumulative impacts, if present, are identified in the corresponding topic areas of Section 4.28.
<b>ENVIRONMENTAL JUSTICE</b>
Following the definition for cumulative impacts presented at the beginning of this section, an impact must result from BLM management direction before a cumulative impact will occur. Since there are no environmental justice issues, no cumulative impacts would occur.
<b>HEALTH AND SAFETY</b>
Alternative E would reduce the long term risk of large-scale fires and the risk of personal injuries and destruction of personal property associated with wildfires, largely offsetting the anticipated increases in wildfire risk arising from various interrelated projects.



## 4.29 Potential Mitigation and Monitoring

Mitigation of potential impacts was a primary consideration when developing management direction for analysis in the Ely District RMP/EIS. Thus, **Table 2.4-1** contains mitigation that varies among alternatives. For example, alternatives vary as to the area closed to oil and gas leasing, and ACECs vary in the acreage proposed for designation. These differences represent a form of mitigation.

Secondly, standard operating procedures and best management practices that would apply to all alternatives have been developed. These procedures and practices avoid or minimize impacts and, thus, eliminate the need for future mitigation (i.e., built in rather than added on). Standard operating procedures, best management practices, and leasing terms and conditions are presented in seven appendices to the RMP/EIS and were considered to be in place for impact analysis. These appendices are:

- Appendix B – The BLM’s Proposed Wind Energy Development Program
- Appendix H – Standard Operating Procedures
- Appendix I – Record of Decision for the Caliente MFP Amendment, September 2000
- Appendix J – BLM Nevada Migratory Bird Best Management Practices for the Sagebrush Biome
- Appendix K – Sage Grouse Best Management Practices
- Appendix L – Standard Terms and Conditions for Mineral Development within the Ely District
- Appendix N – Standard Requirements for Lands and Realty Actions within the Ely District

Lastly, monitoring would be an integral part of the watershed analysis process, restoration plan development, and adaptive management. The role of monitoring is described in Chapter 1.0 (Section 1.7.4).

Most of the management direction presented in the RMP/EIS is at a programmatic level, making it difficult to develop specific mitigation measures. However, a watershed restoration plan would be developed for each of the 61 watershed management units on the District. An environmental assessment would be prepared for each of these plans (either individually or in a logical grouping), and the development of project-specific mitigation would be part of the NEPA compliance process. At the watershed level, it would be possible to look at the interaction

### **Monitoring**

*Monitoring will involve the application of current and evolving scientific knowledge and data in an adaptive management context to ensure that treatments are beneficial. The plan will identify specific indicators (as identified in Resource Advisory Council standards [Appendix A] and methods [BLM Technical References]) intended to detect changes in ecological health. Follow-up monitoring on treatments will be done multiple times and up to 10 years following treatment to determine the long-term effects of treatments.*

of all the resource programs present, the types of vegetation treatment and other restoration activities that are required, and the mitigation and monitoring that are necessary to minimize impacts and ensure successful restoration. The public would have the opportunity to be a part of the watershed restoration process and comment on the mitigation and monitoring that are proposed prior to the plan being implemented.







### 4.30 Unavoidable Adverse Impacts

Unavoidable adverse impacts are impacts that remain following the implementation of mitigation measures, or impacts for which there are no mitigation measures. Some unavoidable adverse impacts occur as a result of proposed management under one or more of the alternatives, while others are a result of public use of the BLM-administered lands within the District. For example, watershed restoration activities would be the primary cause of unavoidable adverse impacts from management actions; while public uses such as livestock grazing, mineral development, and off-highway vehicle use would be the primary causes of unavoidable adverse impacts by the public. Potential unavoidable adverse impacts are difficult to quantify and could extend far into the future. The following sections discuss those unavoidable adverse impacts that have been identified for the proposed management direction on the Ely District. If a resource program is not mentioned, it was judged that there would be no important unavoidable adverse impacts to that resource or resource use.

Air Quality – Smoke generated from wildfires, managed natural fires, and prescribed burns would be unavoidable, but impacts would be short term.

Water Resources – Vegetation treatment that is part of watershed restoration could result in increased sedimentation of surface waters. This impact is expected to be short term until new vegetation stabilizes treated areas.

Soils Resources – Vegetation treatment that is part of watershed restoration could result in increased soil erosion. This impact is expected to be short term until new vegetation stabilizes treated areas. Authorized and unauthorized off-highway vehicle use would continue to be a concern as it relates to rutting and soil erosion.

Vegetation and Special Status Plants – Vegetation treatment that is part of watershed restoration would alter vegetation communities and could result in the direct loss of special status plants that have not been previously identified. The restoration of resilient plant communities in the long term would be better able to recover following wildfire and resist the invasion of annual plants such as cheatgrass. Special status plants would have better survival prospects in restored watersheds. Livestock grazing, wild horses, and off-highway vehicle use also could adversely affect vegetation, especially special status plants.

#### *RMP Management Focus*

*The restoration and maintenance of healthy ecological systems within watersheds is a primary focus for the future management of the Ely District. Healthy ecological systems are geographically diverse and change over time. They are compatible with soil potential and are resilient to disturbance.*

*Resources and resource uses will be managed to restore or maintain ecological health. Certain resource management changes and active treatments may need to be implemented, in portions of watersheds, to accomplish this objective. Adaptive management will be pursued to avoid deteriorating conditions favoring invasive plants and catastrophic fires. Any projects will be implemented so as to result in a mosaic of vegetation within a watershed.*

*In the long term, natural disturbance (such as drought or fire) will occur and fewer treatments will be needed to maintain ecological health. The result will be a variety of vegetation phases within a watershed, which will provide diverse, healthy conditions for future generations.*



## 4.0 ENVIRONMENTAL CONSEQUENCES

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Fish, Wildlife, and Special Status Species – Vegetation treatment that is part of watershed restoration, particularly managed/prescribed fire and mechanical tools and techniques, could result in increased sedimentation to surface waters, a reduction of certain types of wildlife habitat, and a decrease in the number of individuals locally. These impacts are expected to be short term until new vegetation stabilizes treated areas, and restored watersheds would provide better habitat for fish and wildlife in the long term. Off-highway vehicle use also could disturb sensitive wildlife.

Cultural Resources – While measures are in place to identify and mitigate impacts to cultural resources, some impacts would be unavoidable. Vegetation treatment tools and techniques have the potential to disturb recorded and unrecorded cultural resource sites. Off-highway vehicle use, other forms of recreation that could result in casual collecting or vandalism, and mineral exploration and development activities would continue to result in adverse impacts to cultural resources. Lastly, natural processes of erosion and weathering would continue to degrade cultural resources.

Visual Resources – Wildfire and vegetation treatment, particularly managed/prescribed fire and mechanical tools and techniques, would cause changes in the visual character of those areas affected. Pinyon-juniper woodlands would experience the most noticeable changes. Treated areas may display reduced or unnoticeable visual contrast once vegetation has become reestablished, or they may show signs of human intervention for decades following treatment. Mineral development would have adverse but localized impacts to visual resources. Unauthorized, cross-country, off-highway vehicle travel could create linear scarring of the landscape.

Recreation – Watershed restoration and mineral development activities could displace recreation during active periods. Once restoration is established and development areas are reclaimed, recreation could once again take place in these areas. Changes in the amount and patterns of off-highway vehicle use could result in increased conflicts between users and unanticipated changes in recreation resource conditions.

Livestock Grazing and Wild Horses – Watershed restoration would modify range conditions, temporarily reducing forage, and would require restricting livestock from treated areas until vegetation has become sufficiently established to withstand grazing. Since wild horses cannot be effectively excluded from treated areas, they would continue to influence the rate and success of watershed restoration. In the long term, restored watersheds would provide improved range for livestock and wild horses. Off-highway vehicle use can also disturb wild horses.

Woodland and Native Plant Products – An unavoidable impact of watershed restoration would be a reduction in the number of mature pinyon pines found on the District. (Pinyon pine would not be removed under Alternative D.) This reduction would not adversely affect fuel wood and pinyon pine nut harvesting, as supply would continue to exceed demand. Other native plants also would be affected by vegetation treatment, which could adversely affect their use until restoration is completed.

Mineral Extraction – An unavoidable effect of closing areas to mineral leasing, entry, or sales, is the requirement to forego the development of potential mineral resources in these areas and the societal benefits that would be derived from these minerals.



Watershed Management – Livestock grazing, off-highway vehicle use, and mineral exploration and development activities could slow watershed restoration success, if conducted at an inappropriate time or in an inappropriate manner.

Fire Management – Off-highway vehicle use, other forms of recreation, and mineral exploration and development activities would continue to be potential causes of wildfires.







#### **4.31 Relationship Between the Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity**

Not all of the management direction proposed for the Ely District has implications for short-term uses and long-term productivity. Short-term is defined as 10 years beginning with the signing of the Record of Decision. Long-term is defined as greater than 10 years beginning at the same point. Managed short-term uses of renewable resources, such as forage use for livestock grazing and woodland products use for commercial and personal needs, would not cause reductions in long-term productivity. Management would be expected to maintain and enhance long-term productivity. Use of nonrenewable resources, such as oil, gas, and other mineral development, would eliminate the availability of these resources for future generations. Thus, by their extractive nature, these short-term uses would not maintain long-term productivity.

The component of the Ely District RMP/EIS that would have the greatest influence on the maintenance and enhancement of long-term productivity is the restoration of watersheds through implementation of the watershed analysis process. The alternatives analyzed in the RMP/EIS would implement restoration activities on individual watersheds, targeting different numbers of acres to be treated each year. The vegetation treatment component of watershed restoration can be viewed as a short-term use of the environment, since the various tools and techniques that may be used (such as managed fire, herbicide treatment, or mechanical treatment) would disturb the communities being treated. However in the long term, the goal of the treatments is to restore the communities to a more resilient and productive state through the removal of over-mature or invasive-dominated vegetation. The restoration process could take 50 to 100 years, depending on the vegetation community being treated and climatic factors following treatment. Thus, restoration activities could reduce productivity in the short term but would ultimately enhance productivity in the long term.







**4.32 Irreversible or Irretrievable Commitments of Resources**

The management direction proposed for the Ely District could result in either the irreversible or irretrievable commitment of certain resources. Irreversible is a term that describes the loss of future options. It applies primarily to the effects of use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity, that are renewable only over very long periods of time. Irretrievable is a term that applies to the loss of production, harvest, or use of natural resources. For example, livestock forage production from an area is lost while an area is undergoing landscape restoration. The production lost is irretrievable, but the action is not irreversible. Once the watershed is restored, forage production would increase and livestock grazing could resume, potentially at a higher rate. Irreversible and irretrievable commitments for Alternative E are summarized on **Table 4.32-1**.



Table 4.32-1  
Irreversible and Irretrievable Commitment of Resources for Alternative E

Resource Program	Irreversible Commitments	Irretrievable Commitments	Explanation
<b>Physical and Biological Resources</b>			
Air Quality	No	No	No decisions that would permanently degrade air quality are proposed.
Water Resources	No	No	Water quality effects that occur during watershed restoration would be reversible.
Soil Resources	Yes	No	Loss of soils due to erosion during watershed restoration would be irreversible.
Vegetation	Yes	Yes	Changes in vegetation communities from wildfire, cheatgrass invasion, or watershed restoration activities may not be reversible or may be reversible only after many decades. Vegetation production lost to drought, wildfire, and invasive plants and resources committed for vegetation treatment would be irretrievable.
<b>Fish and Wildlife</b>			
Aquatic Habitat and Fisheries	No	No	No decisions that would permanently degrade aquatic habitat are proposed. Water quality effects that occur during watershed restoration would be reversible.
Wildlife	Yes	Yes	Changes in wildlife habitat from wildfire, invasive plants, or watershed restoration activities may not be reversible or may be reversible only after many decades. Big game production lost to wildfire and habitat changes would be irretrievable.
<b>Special Status Species</b>			
Plant Species	Yes	No	Effects to special status plants from authorized and unauthorized activities, wildfire, invasive plants, or watershed restoration activities may not be reversible.
Aquatic Species	No	No	No decisions that would permanently degrade aquatic habitat are proposed. Water quality effects that occur during watershed restoration would be reversible.
Wildlife Species	Yes	No	Effects to special status animals from authorized and unauthorized activities, wildfire, invasive plants, or watershed restoration activities may not be reversible.



Table 4.32-1 (Continued)

Resource Program	Irreversible Commitments	Irretrievable Commitments	Explanation
Wild Horses	No	No	No decisions that would preclude the management of wild horse herds at the appropriate management level are proposed.
Cultural Resources	Yes	No	Authorized mitigation of cultural sites prior to disturbance and unauthorized collecting and vandalism would result in an irreversible commitment of the resource.
Paleontological Resources	Yes	No	Authorized and unauthorized collecting of fossils would result in an irreversible commitment of the resource.
Visual Resources	No	Yes	The opportunities to view undisturbed settings that are lost during watershed restoration activities would be irretrievable.
<b>Resource Uses</b>			
Lands and Realty	Yes	No	As a practical matter, disposal of public lands would be irreversible. Authorized activities that make lands unsuitable for disposal would be minimal.
Renewable Energy	No	No	No decisions that would limit the development of renewable energy are proposed.
Travel Management and Off-highway Vehicle Use	Yes	No	Scarring of the landscape that results from authorized and unauthorized off-highway vehicle use can be irreversible.
Recreation	No	Yes	Recreation opportunities that are lost during watershed restoration activities would be irretrievable.
Livestock Grazing	Yes	Yes	Invasion of rangelands by cheatgrass may be irreversible. Loss of forage production during watershed restoration would be irretrievable.
Woodland and Native Plant Products	No	Yes	Loss of woodland and native plant production during watershed restoration would be irretrievable.
<b>Geology and Mineral Extraction</b>			
Leasable Minerals	Yes	Yes	Production of oil and gas would be an irreversible use of the resource. Closing an area to leasing would constitute an irretrievable commitment of the potential resources for the life of the RMP.
Locatable Minerals	Yes	Yes	Mining of locatable minerals (primarily hard-rock) would be an irreversible use of the resource. Withdrawal of an area from mineral entry would constitute an irretrievable commitment of the potential resources for the life of the RMP.



Table 4.32-1 (Continued)

Resource Program	Irreversible Commitments	Irretrievable Commitments	Explanation
Mineral Materials	Yes	Yes	Mining of saleable minerals (e.g. sand and gravel) would be an irreversible use of the resource. Denial of the sale of mineral materials would constitute an irretrievable commitment of the resources for the life of the RMP.
Watershed Management	Yes	Yes	Changes in vegetation communities that would result from restoring or not restoring watersheds may not be reversible or may be reversible only after many decades. Resources committed for watershed restoration would be irretrievable.
Fire Management	Yes	Yes	The effects of a high intensity wildfire would be reversible only after several decades. Resources committed for fire suppression and rehabilitation would be irretrievable.
Noxious and Invasive Weed Management	Yes	Yes	Invasion of rangelands and other sites by cheatgrass and other noxious or invasive weeds may be irreversible. The resources committed to manage weeds (e.g. herbicides) would be irretrievable.
Special Designations	No	No	Special designations require no irreversible or irretrievable commitment of resources.
<b>Economic and Social Conditions</b>			
Economic Conditions	Yes	No	Disposal of public land to facilitate economic development of the cities and counties within the District would be irreversible.
Social Conditions	No	No	No decisions that would affect social conditions are proposed.
Native American Issues	No	No	No decisions that result in Native American issues are proposed.
Environmental Justice	No	No	No decisions that would affect environmental justice are proposed.
Health and Safety	No	No	No decisions that would degrade health or safety are proposed.



### 4.33 Energy Requirements and Conservation Potential of Alternatives and Mitigation Measures

Since the majority of the management direction contained in the Ely District RMP/EIS is at the land use planning level, no direct energy consumption is involved. Watershed restoration activities that will follow the approval of watershed restoration plans will require energy in the form of liquid fuels for vehicles and equipment. The amount of fuel consumed and the potential for conservation will depend on the tools and techniques being applied to a specific watershed, the remoteness of the treatment area, and a number of other factors. The NEPA analysis that is completed for the individual watershed restoration plans will consider the energy requirements and conservation potential of the tools and techniques that are being proposed.







#### **4.34 Natural or Depletable Resource Requirements and Conservation Potential of Alternatives and Mitigation Measures**

Since the majority of the management direction contained in the Ely District RMP/EIS is at the land use planning level, resource requirements are not part of the decisions that would be implemented. Certain programs by their nature utilize renewable and nonrenewable resources, as specified by BLM's multiple use policies. For example, the livestock grazing and wild horse programs utilize forage for domestic livestock and wild horses, while the minerals program develops depletable fluid and non-fluid minerals. However, the alternatives analyzed in this EIS, aside from Alternative D, do not differ in any significant way as to their natural or depletable resource utilization or conservation potential. Alternative D includes provisions that would seriously constrain or preclude utilization or development of these same natural and depletable resources.







**4.35 Urban Quality, Historic, and Cultural Resources, and the Design of the Built Environment, Including the Reuse and Conservation Potential of Various Alternatives and Mitigation Measures**

The management direction contained in the agency-preferred alternative and other alternatives would have no effect on urban quality or the built environment. Various historic and cultural resources are found throughout the Ely District. One of the three management choices for these resources is their conservation for future generations; the other two are scientific study and public use.

Management of cultural resources in the District would vary not only by the alternative chosen, but also by site type and its specific use allocation. Overall, the majority of sites types would be best protected and preserved in place under Alternative A and Alternative E, since most sites would be allocated and managed for Conservation, Scientific, or Public Use, with greater emphasis on Conservation Use. Alternative B is similar to Alternative A for prehistoric sites; however, for all other site types, the emphasis would be to allocate and manage the resources for Public Use. Under Alternative C, a greater number of sites would be discharged from management. Alternative D would manage cultural resources the same as Alternative A, which does not designate use allocations for individual site types.







## 4.36 Adverse Energy Impact

BLM Instruction Memorandum No. 2002-053 directs that the adverse impacts of decisions on “energy development, production, supply, and/or distribution” will be considered. The revised Ely RMP will provide NEPA coverage for oil and gas leasing in the area of the former Schell and Caliente Resource Areas. Adequate analysis under NEPA would ensure that legally defensible leases can be issued and industry can have confidence that challenges to leases can be successfully defended. The area of the former Egan Resource Area is covered by the EIS for the Oil and Gas Amendment. The decisions that will result from this planning process do not address any specific energy project. Provisions have been made in the RMP for energy development, production, and distribution. However, closing certain areas to oil, gas, and geothermal leasing has been proposed and has the potential to affect future energy development. Of the total of 6.76 million acres having high potential for oil and gas resources, about 0.4 million acres would be closed to leasing under Alternative E. Of the total of 6.76 million acres having medium potential for geothermal resources, about 0.4 million acres would be closed to leasing under Alternative E. The other alternatives considered in this EIS would have essentially the same area closed to leasing with the exception of Alternative D. Alternative D would close 6.76 million acres of high potential areas to oil and gas leasing and 6.76 million acres of medium potential areas to geothermal leasing.

The reasonably foreseeable development scenarios anticipate 7,122 acres of disturbance for oil and gas exploration and development, and 134 acres of disturbance for geothermal exploration and development. Given that 9.6 million acres would remain open to oil and gas leasing and 9.6 million acres would remain open to geothermal leasing, the proposed closing to leasing of those areas outlined in this RMP would have a minimal adverse energy impact. When specific proposals are made for energy development, production, supply, and/or distribution, the decisions reached by BLM will be reviewed again for adverse energy impact, and the results of that review will be disclosed.







## 5.0 CONSULTATION AND COORDINATION

### 5.1 Description of Specific Actions Taken to Consult and Coordinate

From the initiation of work on the RMP/EIS, the Ely Field Office has set consultation and coordination with affected or interested parties as a key priority. There have been five primary elements of consultation through preparation of the Draft RMP/EIS:

- RMP/EIS scoping process
- Planning bulletin mailings
- RMP/EIS web page
- Informal presentations to interested groups
- Cooperating agency involvement

Each of these activities is summarized below.

#### 5.1.1 RMP/EIS Scoping Process

In February 2003, with the publication of the Notice of Intent to begin the planning process, the BLM Ely Field Office initiated public scoping for issues pertaining to the RMP/EIS. Scoping is the process required in the early stages of developing an EIS to encourage public participation and solicit public input on the scope and significance of the proposed action (Council on Environmental Quality Regulations, 40 Code of Federal Regulations 1501.7). Scoping helps identify issues important to the management of the area and assists in determining the extent of the analysis as well as specific issues to be examined in the planning process.

A 60-day scoping period formally began with the publication of the Notice of Intent in the Federal Register on February 10, 2003, documenting BLM's intent to prepare an EIS. Individuals and organizations were invited to submit comments in writing to the BLM. The notice also published information on the web site address where public scoping meeting dates would be posted and described how the scoping meetings would be publicized in local media before the meetings were to take place.

On February 24, 2003, a Planning Bulletin was sent to over 3,000 homes and organizations. The bulletin again provided information on how the public could obtain information about the upcoming public scoping meetings. Additionally, the bulletin provided an overview of the EIS process and timeline and general information about the RMP/EIS scope and issues to be addressed.

Once scoping meetings were scheduled, public notice of the meetings was published in local newspapers (see **Table 5.1-1**).

Additional press releases noting meeting dates and providing an explanation of the planning process were sent to numerous media outlets. See **Table 5.1-2** for a list of print and radio media that received various press releases.



**Table 5.1-1**  
**List of Paid Newspaper Advertisements Announcing Scoping Meetings**

Location	Periodical
Ely, Nevada	Ely Times
Las Vegas, Nevada	Las Vegas Review Journal Las Vegas Sun
Mesquite, Nevada	Desert Valley Times
Pioche, Nevada	Lincoln County Record
Tonopah, Nevada	Tonopah Times-Bonanza
St. George, Utah	The Spectrum

**Table 5.1-2**  
**List of Media Outlets Receiving Various Press Releases**

Location	Print	Radio
Alamo, Nevada	Our Valley Voice	--
Elko, Nevada	Elko Daily Free Press	KELK 1240 AM KLKO 93.7
Ely, Nevada	Ely Times	KCLS 101.7 FM KELY 1230 AM KDSS 92.7 FM
Eureka, Nevada	The Eureka Sentinel	--
Las Vegas, Nevada	Las Vegas Review Journal Las Vegas Sun Los Angeles Times	KNPR
Mesquite, Nevada	Desert Valley Times	--
Pioche, Nevada	Lincoln County Record	--
Reno, Nevada	Associated Press Reno-Gazette Journal	KOH KUNR
Tonopah, Nevada	Tonopah Times-Bonanza	--
Wendover, Nevada	High Desert Advocate	--
Cedar City, Utah	The Spectrum	Star 98 KREC, KSNN, KZHK, KUNF, KDXU, KSUB
St. George, Utah	The Spectrum	--

Six public meetings were held in March/April, 2003. During the meetings, the BLM took notes as the public provided oral comments. Written comments also were received throughout the 60-day comment period, ending April 10, 2003. Both written comments and those received at scoping meetings are in the administrative record. Summaries of these comments are contained in the scoping report for the RMP/EIS. **Table 5.1-3** provides the date, location, and attendance for the six scoping meetings. The Scoping Report is available on the Ely RMP/EIS web page (<http://elyrmp.ensr.com>).



**Table 5.1-3**  
**Public Scoping Meeting Locations and Dates**

City, State	Location	Date	Attendance
Ely, Nevada	Bristlecone Convention Center	Monday, March 24, 2003	33
Caliente, Nevada	Caliente Elementary School Gymnasium	Tuesday, March 25, 2003	12
Mesquite, Nevada	City Hall	Wednesday, March 26, 2003	10
Las Vegas, Nevada	BLM Las Vegas Field Office	Thursday, March 27, 2003	12
Reno, Nevada	Airport Plaza Hotel	Monday, March 31, 2003	14
Tonopah, Nevada	Tonopah Convention Center	Tuesday, April 1, 2003	4
<b>Total</b>			<b>85</b>

Written comments also were solicited during the scoping process. Ninety-three (93) letters were received via mail, fax, e-mail, an on-line web comment form, or handed in during the scoping meetings. These letters from individuals and organizations contained 798 unique comments for consideration in the planning process. Comment letters were received primarily from Nevada, but a few comments also were received from the states of Washington, Idaho, Montana, Wyoming, Utah, and Colorado. Comments from Nevada were distributed by county as shown in **Table 5.1-4**.

**Table 5.1-4**  
**Comment Letters Received by County in Nevada**

County	Letters	Percent
Carson	11	13
Clark	35	42
Elko	2	2
Eureka	1	1
Lincoln	9	11
Nye	1	1
Washoe	17	19
White Pine	8	10
<b>Total</b>	<b>84</b>	<b>100</b>

### 5.1.2 Planning Bulletins

Throughout the planning process, the BLM will prepare planning bulletins to keep the public updated on the status of the RMP/EIS. These bulletins are distributed to a mailing list of over 3,000 interested parties and also are placed on the project web page so they can be retrieved electronically. Planning Bulletin #1 became available in late February 2003 and Planning Bulletin #2 in late August 2003. The planning bulletins have discussed topics such as:

- The purpose of and schedule for the RMP/EIS;
- The need for ecological restoration within the District;
- Opportunities for public involvement;
- Results of the scoping process;



- Nomination of ACECs;
- The involvement of cooperating agencies;
- Progress on developing alternatives to be analyzed in the RMP/EIS;
- Interesting information about the Ely District and the activities of the Ely Field Office; and
- Short biographies of team members that are preparing the RMP/EIS.

Future planning bulletins will focus on the public's review of the Draft RMP/EIS, the upcoming public meetings on the Draft, the preparation of and schedule for the Proposed RMP and Final EIS, the Final RMP and Record of Decision, and the protest process.

### 5.1.3 RMP/EIS Web Page

The Ely RMP/EIS web page "went live" in November 2002 and can be accessed by the public at <http://elyrmp.ensr.com>. The web page is a convenient way for the BLM to communicate with the public concerning the RMP/EIS, and it provides the public with instant access to the ongoing EIS process as well as background information on the BLM planning process. Key menus on the web page include:

- General Information (including background on the Ely District and the Ely RMP/EIS Planning Bulletins)
- Planning Process (including background and regulations on the BLM planning process and schedule for the EIS process)
- Public Involvement (including meeting dates and forms to comment on the process electronically)
- Documents (including the Scoping Report, this Draft RMP/EIS, and ultimately the Final RMP/EIS and Record of Decision)
- Maps and Data (including Geographic Information System maps of the Ely District)
- Links (including access to other BLM web sites, RMPs, and EISs in the region)

### 5.1.4 Informal Presentations

The BLM Ely Field Office has strived to make the EIS process as inclusive as possible. In addition to input from the general public, BLM staff has encouraged participation and collaboration from multiple governmental entities and public organizations. BLM staff has attended numerous meetings in addition to the six official public scoping meetings and provided presentations to organizations and commissions as invited (see **Table 5.1-5**).



Table 5.1-5  
Presentations Provided to Organizations

Meeting/Organization	Date	Approximate Attendance
White Pine County Public Land Users Advisory Committee	10/08/02	8
Ely Shoshone Tribe	10/17/02	6
Northeastern Great Basin Resource Advisory Council	12/06/02	20
Nevada Department of Wildlife (Northern Division)	03/06/03	10
Nevada Department of Wildlife (Southern Division)	03/13/03	10
Ely Rotary Club	03/20/03	25
Mojave Southern Resource Advisory Council	04/04/03	20
Mount Wheeler Power Board of Directors	04/08/03	10
Duckwater Shoshone Tribe	04/10/03	5
Tri-County (White Pine, Lincoln, Nye) Meeting	04/30/03	20
White Pine Economic Development Committee	05/07/03	15
Coyotes Motorcycle Club	05/15/03	15
Goshute Tribal Council	09/12/03	10
Mojave Southern Resources Advisory Council	10/17/03	20
Utility Organizations	10/23/03	6
<b>Total</b>		<b>200</b>

### 5.1.5 Cooperating Agencies

Letters inviting various agencies and organizations to participate in the RMP/EIS planning process as formal cooperating agencies were sent to over 30 groups. Cooperating agencies are requested to assist in developing management direction and alternatives, reviewing environmental effects, and selecting a preferred alternative. They also are invited to participate on RMP/EIS-related conference calls and attend RMP/EIS-related meetings. Entities invited to serve as cooperating agencies are as follows:

#### Tribal Governments

Duckwater Shoshone  
Ely Shoshone  
Goshute Shoshone  
Moapa Paiute  
Paiute Indian Tribe of Utah  
Las Vegas Paiute  
Yomba Shoshone

#### County Government

White Pine County  
Lincoln County  
Nye County



### State Government

Nevada Division of State Lands  
Nevada Division of State Parks  
Nevada Department of Transportation  
University and Community College System of Nevada  
Nevada Department of Wildlife  
Nevada Department of Agriculture  
Nevada Division of Water Resources  
Nevada Division of Environmental Protection  
Nevada State Historic Preservation Office  
Nevada Division of Minerals  
Nevada Wildhorse Commission

### Federal Government

Forest Service  
Army Corps of Engineers  
Fish and Wildlife Service  
Bureau of Indian Affairs  
National Park Service  
Department of Defense  
Minerals Management Service  
Department of Energy  
Natural Resource Conservation Service

Several of the entities have agreed to serve as cooperating agencies and have had varying levels of involvement in the development of this Draft RMP/EIS. These agencies and groups will continue to be involved through preparation of the Final RMP/EIS. Cooperating agencies for the Ely RMP/EIS are as follows:

- Duckwater Shoshone Tribe
- Ely Shoshone Tribe
- Great Basin National Park
- Humboldt-Toiyabe National Forest
- Lincoln County
- Moapa Band of Paiutes
- Nellis Air Force Base
- Nevada Division of Minerals
- Nevada Division of Transportation
- Nevada Department of Wildlife
- Nevada State Historic Preservation Office
- Nye County
- White Pine County
- Yomba Shoshone Tribe



## 5.2 Tribal Consultation

### 5.2.1 Tribal Consultation Responsibilities

As federal agents, the BLM is mandated to consult with American Indian tribes concerning the identification of cultural values, religious beliefs, and traditional practices of American Indian people that may be affected by actions on federal lands. Tribal consultation is the active, affirmative process of: 1) identifying and seeking input from appropriate American Indian governing bodies, community groups, and individuals; and 2) considering their interests as a necessary and integral part of the BLM's decision making process. The aim of consultation is to involve affected American Indian groups in the identification of issues and the definition of the range of acceptable management options.

Tribal consultation includes the identification of places (i.e., physical locations) of cultural value to American Indian groups. Places that may be of cultural value include, but are not limited to, locations associated with the traditional beliefs concerning tribal origins, cultural history, or the nature of the world; locations where religious practitioners go, either in the past or the present, to perform ceremonial activities based on traditional cultural rules or practice; ancestral habitation sites; trails; burial sites; and places from which plants, animals, minerals, and waters possessing healing powers or used for other subsistence purposes, may be taken. Additionally, some of these locations may be considered sacred to particular American Indian individuals or tribes. Under the auspices of the American Indian Religious Freedom Act of 1978, Executive Order 13007, the Native American Graves Protection and Repatriation Act of 1990, and the National Historic Preservation Act, as amended, the BLM must take into account the effects of land use decisions on these types of locations. See Traditional Cultural Properties under Section 3.9, Cultural Resources, for a summary on tribal consultation conducted as part of the RMP/EIS process.

The BLM works in cooperation with American Indian tribes to coordinate and consult before making decisions or approving actions that could result in changes in land use, physical changes to lands or resources, changes in access, or alienation of lands. The Federal Land Policy and Management Act and the National Historic Preservation Act of 1966, as amended, require coordination with tribes in preparing and maintaining inventories of the public lands and determining their various resources and other values, developing and maintaining long-range plans providing for the use of the public lands, and managing the public lands. Federal programs are required to be carried out in a manner sensitive to American Indian concerns and tribal government planning and resource management programs.

In compliance with the federal mandates identified above, a number of Western Shoshone, Goshute, and Southern Paiute reservations, colonies, organizations, and individuals were contacted for the Ely District RMP/EIS. The Western Shoshone included the Te-Moak Tribes, Battle Mountain Band, Elko Band, South Fork Band, Wells Band, Duckwater Shoshone Tribe, Ely Shoshone Tribe, Timbisha Shoshone Tribe, Yomba Shoshone Tribe, Duck Valley Sho-Pai Tribes, the Western Shoshone Historic Preservation Society, Nevada Indian Commission, Intertribal Council of Nevada, and Western Shoshone Defense Project. Included for the Gosiute were the Goshute Tribe (Ibapah) and Skull Valley Band of Gosiute. The Southern Paiute included the Paiute Tribe of Utah, Las Vegas Paiute Tribe, Moapa Paiute Tribe, the Colorado Indian Tribes, the Chemehuevi Tribe, and individuals residing in Eagle Valley and Caliente.



## 5.0 CONSULTATION AND COORDINATION

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The coordination and consultation process was initiated with mail and telephone correspondence. Letters were posted describing the RMP/EIS process and soliciting input from the tribes and individuals. The letters were followed by telephone calls to discuss the RMP/EIS, potential cultural concerns and sites, individuals knowledgeable about the area, and possible meetings. Meetings and interviews were then scheduled and held over a 2-week period. Participants included the Ely Shoshone, Duckwater Shoshone, Yomba Shoshone, Battle Mountain Shoshone, Ibapah Goshute, Paiute Tribe of Utah, Moapa Paiute, and individuals residing in Caliente and Eagle Valley. In the meetings and interviews, the RMP/EIS was described and discussions were held regarding places of importance to the tribes. Questions were asked about tribal concerns for these places, and the nature and importance of the overall cultural landscapes. Details of the correspondence and meetings with the tribes and individuals are detailed in a separate, confidential report.



#### 5.3 Agencies Contacted During Preparation of the Draft RMP/EIS

Bureau of Land Management, Arizona Strip Field Office, Utah  
Bureau of Land Management, Battle Mountain Field Office  
Bureau of Land Management, Cedar City Field Office, Utah  
Bureau of Land Management, Elko Field Office  
Bureau of Land Management, Fillmore Field Office, Utah  
Bureau of Land Management, Las Vegas Field Office  
Bureau of Land Management, Salt Lake Field Office, Utah  
Bureau of Land Management Sciences Center  
Bureau of Land Management, St. George Field Office, Utah  
Bureau of Land Management, Tonopah Field Station Office  
Lincoln County Planning Office  
Nevada Division of Environmental Protection  
Nevada Division of Minerals  
Nevada Department of Wildlife  
Nevada Natural Heritage Program  
Ruby Lake National Wildlife Refuge  
U.S. Army Corps of Engineers  
U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services  
U.S. Department of Energy, National Renewable Energy Laboratory  
U.S. Fish and Wildlife Service  
U.S. Geological Survey







## 5.4 Plan Distribution

Since initial scoping, BLM has maintained a mailing list of individuals, businesses, special interest groups, and federal, state, Tribal, and local government representatives interested in development of the Ely RMP. In an effort to reduce printing costs, notices were mailed to everyone on the RMP/EIS mailing list in May 2004 to remove those no longer interested in the process from the mailing list. People responding to this notice by June 25, 2004, were shipped the copy of this document that they requested.

Copies of the Draft RMP/EIS also are available for public inspection at the following locations:

BLM Caliente Field Station	Lincoln County Courthouse
BLM Elko Field Office	Lincoln County Public Library
BLM Ely Field Office	Nye County Courthouse
BLM Las Vegas Field Office	Nye County Public Library
Great Basin National Park	White Pine County Courthouse
U.S. Forest Service, Ely Ranger District	White Pine County Public Library

The Draft RMP/EIS also is available electronically at the Ely RMP/EIS website; <http://elyrmp.ensr.com>.

Concurrent with the distribution of the Draft RMP/EIS, a Notice of Availability was published by the Environmental Protection Agency in the Federal Register, which marks the beginning of the 90-day review and comment period. BLM also published a Notice of Availability in the Federal Register announcing the availability of the Draft RMP/EIS for public review and comment.







**5.5 List of Agencies, Organizations, and Persons to whom Copies of this Statement are Sent**

The Draft RMP/EIS was mailed to agencies, organizations, and individuals requesting either a hard copy, CD version, or Executive Summary. Hard copies of the Draft RMP/EIS have also been distributed to agencies and Tribal governments as required by regulation or policy.

**Federal Government Agencies**

Interior Department  
Office of Federal Activities, Environmental Protection Agency  
US Air Force Regional Environmental Office  
USDA Agricultural Research Service  
USDA Forest Service, Humboldt-Toiyabe National Forest  
USDA Natural Resources Conservation Service  
USDI Bureau of Indian Affairs, Western Nevada Agency  
USDI Bureau of Indian Affairs, Western Region  
USDI Bureau of Land Management, Battle Mountain Field Office  
USDI Bureau of Land Management, Carson City Field Office  
USDI Bureau of Land Management, Elko Field Office  
USDI Bureau of Land Management, Las Vegas Field Office  
USDI Bureau of Land Management, Nevada State Office  
USDI Bureau of Land Management, Washington Office  
USDI Fish and Wildlife Service, Las Vegas  
USDI Fish and Wildlife Service, Reno  
USDI Fish and Wildlife Service, Pahrangat National Wildlife Refuge  
USDI Fish and Wildlife Service, Ruby Lake National Wildlife Refuge  
USDI National Park Service, Great Basin National Park  
USDI National Park Service, Regional Office, Denver  
USDI Natural Resources Library  
USDI Office of Environmental Policy and Compliance  
USDI Office of Public Affairs  
USDOE  
USDOE Federal Energy Regulatory Commission  
USDOT Federal Highway Administration

**State Government Agencies and Organizations**

Honorable Kenny Guinn, Governor of Nevada  
Nevada Commission for the Preservation of Wild Horses  
Nevada Department of Agriculture  
Nevada Department of Conservation and Natural Resources  
Nevada Department of Transportation  
Nevada Department of Wildlife  
Nevada Division of Environmental Protection

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## **5.0 CONSULTATION AND COORDINATION**

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Nevada Division of Forestry  
Nevada Division of Minerals  
Nevada Division of State Parks  
Nevada Division of Water Resources  
Nevada Natural Heritage Program  
Nevada State Board of Sheep Commissioners  
Nevada State Clearinghouse  
Nevada State Grazing Boards Central Committee  
Nevada State Historic Preservation Office  
University and Community College System of Nevada  
University of Nevada, Bureau of Mines and Geology  
University of Nevada, Cooperative Extension  
University of Nevada, Department of Biotechnology

### **Local Governments and Boards of Planning**

Baker Area Citizens Advisory Board  
Carson Colony Recreation Department  
City of Caliente  
Ely City Council  
Eureka County Board of Commissioners  
Eureka County District Attorney  
Eureka County Natural Resources Department  
Lander County Austin Office  
Lincoln County Board of Commissioners  
Lincoln County Clerk  
Lincoln County Power District  
Lincoln County Public Library  
Lincoln County Wildlife Advisory Board  
Nye County Board of Commissioners  
Nye County Dept. of Natural Resources and Federal Facilities  
Nye County Public Library  
Nye County Road Department  
Virgin Valley Water District  
White Pine County Board of Commissioners  
White Pine County Nevada Coop. Extension  
White Pine County Public Library

### **Tribal Governments and Committees**

Duckwater Shoshone Tribe  
Ely Shoshone Tribe  
Moapa Band of Paiutes  
Temoak Tribe Western Shoshone



Washoe Tribal Council  
Western Shoshone National Council  
Yomba Shoshone Tribe

### **Congressionals**

US Representative Shelley Berkley  
US Representative Jim Gibbons  
US Representative Jon Porter  
US Senator John Ensign  
US Senator Harry Reid

### **State Legislators**

Len Carpenter - Assemblyman

### **Nongovernmental Organizations and Businesses**

7H Ranch, LLC  
7J Ranch  
Alpine, Inc.  
Amax Gold, Inc. Sleeper Mine  
American Discovery Trail  
Anvil Magazine  
Audubon Society – California  
Basin Research Associates  
Best in the Desert Racing  
Biowest, Inc.  
Blue Diamond Oil Corp.  
Caliente Youth Center  
California Federal Mineralogical Society  
Carlson and Associates  
Carson Valley Arabian Horse Association  
Carter Cattle Company  
Center for Biological Diversity  
CG Squared  
CL Cattle Company LLC  
Coeur d'Alene Mines Corp.  
Cottonwood Ranch  
Couple's MC/MLAN  
Cove Meadows Ranch  
D4 Ranch  
Desert Mountain Realty, Inc.  
Desert Research Institute

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## 5.0 CONSULTATION AND COORDINATION

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DM Ranch  
Eagle Exploration, Inc.  
Eastern Nevada Landscape Coalition  
El Tejon Cattle Company  
El Tejon Sheep Company  
Equestrian Connection  
Farnsworth Farms  
Filippini Ranching Co.  
FirstMiss Gold Inc.  
Fish Creek Ranch LLC  
Florida Canyon Mining, Inc.  
Friends of Nevada Wilderness  
Frontier Exploration Co.  
Fund for Animals Inc. The  
Garrison Investment Fund, Inc.  
Getchell Gold Corporation  
Great Basin Bird Observatory  
Heklet Association  
HHH Hunting  
HTT Resource Advisors  
Idaho Power  
Indian Creek Ranch  
Interstate Dist. Inc.  
Intertech Services Corp.  
JBR Environmental Consultants, Inc.  
KDJ Associates  
KOA of Ely  
KTVN Channel 2 CBS  
KVBC Channel 3  
Lander County PLUAC  
Larralde Sheep  
Las Vegas Riders  
Laughlin Gambler  
Lincoln County Realty  
Lost City Museum  
Miniad, Inc.  
Mining Engineering  
MJ Bright Minerals Development, Inc.  
Mt Wheeler Power Company  
Mt. Wilson Community Fire Safe Chapter  
Munger Oil Info Service, Inc.  
N-4 Grazing Board and WPCO PLUAC  
National Mustang Association, Inc.  
National Pony Express Association



Natural Resource Defense Council  
Nevada Archeological Association  
Nevada Cement  
Nevada Farm Bureau  
Nevada Historical Society  
Nevada Land and Resource Co. LLC  
Nevada Miners and Prospectors  
Nevada Mining Association  
Nevada Power/Sierra Pacific Power  
Nevada United Four Wheelers Association  
Nevada Wildlife Federation  
Newmont Mining Corp.  
Newmont – Twin Creeks Mine  
NUFWA  
Off Road Com  
Osceola Placer Mine  
Oxidor Corporation  
Pacific Primitive Rendezvous  
Partnership for the West  
Pescio Brothers, AR Pescio & Sons  
PIC Technologies, Inc.  
PlacerDome America / Bald Mountain Mine  
Pleasant Valley Enterprises  
Public Lands Foundation  
Public Resource Associates  
Resource Concepts Inc.  
Robinson Nevada Mining Company  
Rocky Mountain Elk Foundation  
Round Mountain Gold Corporation  
Science Applications  
Sierra Pacific Power  
SNORE  
Society for Conservation Biology, Great Basin Chapter  
Southern Nevada Baptist Association  
Southern Nevada Water Authority, Resources Dept.  
SPPCO  
Steptoe Ranch  
Stonegate Resources LLC  
T Bench Ranch  
The Nature Conservancy of Nevada  
Timberline Outfitters Guide Service  
Toiyabe Chapter of the Sierra Club  
Turner & Irlbeck Ranch  
Vanderbilt Minerals Corporation

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## 5.0 CONSULTATION AND COORDINATION

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Western Land Project  
Western Outdoors  
Western Watersheds Project  
Whipple Cattle Company  
White Pine County Chamber of Commerce  
White Pine Historical and Archaeological Society  
White River Ranch LLC  
Wild Horse Spirit  
Wildlife Management Institute  
Wild Utah Project  
Willow Creek Ranch  
Winn Exploration Co., Inc.  
Working Moms and Dads Magazine  
Yelland Ranch

### **Other Interested/Affected Individuals**

Acton, Richard  
Adams, David  
Alcorn, Ray  
Anpu, S.  
Ataman, Kathryn  
Baker, Carry  
Baughman, S.  
Blades, Doyle  
Boeger, Karen  
Breitrick, John  
Brooks, Elaine  
Brown, Bob  
Buettnner, George  
Bustos, Richard  
Carter, Dean  
Clayton, Thomas  
Clifton, Jack  
Collett, Hugh  
Conner, William & Genell  
Covington, Hilton  
Daniel, Peggy & Wayne  
Decker, Donald  
Devlin, William  
DeWolfe, Terry & Tilda  
Downer, Craig  
Drais, Diane  
Durham, Gail



5.5 List of Agencies, Organizations, and Persons  
to whom Copies of this Statement are Sent

---

Ezra, Elaine  
Fitzgerald, Pat  
Foppiano, Gordon  
Forbush, Curtis  
French, Don  
Gaffin, Stanley  
Gaskin, Dave  
Geddie, John  
Giannopoulos, William  
Gianopoulos, Frank  
Glade, Vernon  
Green, Dale  
Griffin, Mary Lou  
Guymon, Bradley  
Hancock, Charles  
Hankins, Richard  
Harbecke, Robert  
Hartman, Jack  
Hartmann, Shelley  
Hase, Jon  
Heinbaugh, Ken  
Hengen, John  
Hester, Charlie & Vera  
Higbee, Joe  
Hollis, Gary  
Hoover, Craig  
Howe, Patrick  
Howerton, Brent  
Howle, Susan  
Hughes, Arlin & Denice  
Hughes, Melvin & Ione  
Hull, Gordon  
John, Thomas  
Johnson, Abigail  
Jones, Jeffrey  
Jones, Wayne  
Jorgensen, Lynn  
Larson, Donald  
Lear, Kitt  
Lewis, Frank  
Limb, Chadmax  
Lytle, Cory  
Lytle, Farrel & Mauetta  
Lytle, Francis

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## 5.0 CONSULTATION AND COORDINATION

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Maichle, Robert  
Manning, Jarene  
Manzo, Anthony  
Marich, Steven  
McClane, Alvin  
McClymonds, Robert  
McConnell, Anne  
McGloin, Joe  
McGrew, Mike  
McIntosh, Caroline  
McNaught, Richard  
Morris, Mike  
Mosby, Harry  
Mulcahy, Jim  
Nappe, Tina  
Nash, Orren  
Nations, Linda  
Otero, Robert  
Parratt, Ronald  
Polman, Ken  
Rathbun, Floyd  
Reim, Kenneth  
Retzlaff, Fred  
Richey, Scott  
Riddle, Vikki  
Rose, Robert  
Rosevear, Thomas  
Russel, W.  
Schroeder, Alan  
Seeley, Dave  
Sendlein, Steve  
Shearer, Doug  
Slagowski, Carl  
Smith, A.  
Smith, Russell  
Smucker, Richard  
Strolin, Joe & Susan  
Tattam, Dave  
Taylor, Jackson  
Thompson, Lom  
Thomton Potorti, Grace  
Trousdale, Daniel  
Troxel, Richard & Brigitte  
Tucker, Curtis



**5.5 List of Agencies, Organizations, and Persons  
to whom Copies of this Statement are Sent**

---

Vanee, Jeff  
Vogt, Tim  
Wade, Darrell & Terri  
Wallis, Don  
Walter, Gary  
Wame, David & Ruby  
Welch, Bruce  
Whitney, Donald & Connie  
Williams, George & Arasa  
Wilkin, James  
Wines, Sterling  
Wright, Edward  
Wright, Jay  
Young, Craig  
Zurschmiede, James

The Draft RMP/EIS also was mailed to 129 individuals requesting either a hard copy, CD version, or Executive Summary.







## 6.0 PREPARERS AND REVIEWERS

## 6.1 List of Preparers

Responsibility	Name	Degree(s) and Experience
<b>BLM - Ely Field Office (Core Team)</b>		
Project Manager	Gene Drais	BS Zoology 30 years experience
Associate Field Manager	Stephanie Connolly	BS Forestry Management 14 years experience
Assistant Field Manager – Fire Management	Bill Dunn	Associates Degree Park and Recreation Management. 28 years experience
Assistant Field Manager – Renewable Resources	Pete McFadden	MS Natural Resource Administration BS Recreation Management 15 years experience
Assistant Field Manager – Nonrenewable Resources	Jeff Weeks	BS Range Ecology 26 years experience
Assistant Field Manager Mojave Desert Region (all resources)	Rick Orr	BS Forestry/Range Management 27 years experience
Planning and NEPA Oversight	Jake Rajala	MS Forest and Range Management MA Anthropology BA Anthropology 30 years experience
Manager, Eastern Nevada Landscape Restoration Project	Jim Perkins	BS Rangeland Science 29 years experience
Project Manager – Watershed Analysis	Gary Medlyn	PhD Soil Science MS Agronomy BS Agronomy and Horticulture 23 years experience
Eastern Nevada Landscape Coalition Representative; Science Committee	Bill Morrill	PhD Ecology Planning MS Wildlife and Fisheries BS Wildlife and Fisheries 29 years experience
	Bob Wilson	MS Plant Science BS Agriculture Resource Economics 30 years experience
<b>BLM - Ely Field Office (Interdisciplinary Team)</b>		
Water; Hydrology	Kerry Flood	BS Watershed Science/Hydrology 5 years experience
Wild Horses	Jared Bybee	BS Environmental and Natural Resource Sciences; Range 7 years experience
Vegetation; Livestock Grazing; Forestry; Wetlands	Chris Mayer	BS Agriculture 27 years experience
	Cody Coombs	BS Rangeland Resources 6 years experience
Weeds	Karen Prentice	MS Rangeland Ecosystem Science, Restoration Ecology BA Environmental Studies 10 years experience



## 6.0 PREPARERS AND REVIEWERS

Responsibility	Name	Degree(s) and Experience
Lands; Realty	Doris Metcalf	AAS Office Administration 16 years experience
	Ann Perkins	BA Anthropology 10 years experience
Hazardous Materials	Dan Netcher	BS Geology 26 years experience
Fish and Wildlife; Threatened and Endangered Species	Bill Smith	BS Zoology/Wildlife Management 7 years experience
	Mike Perkins	BS Wildlife Science/Fisheries Science AA Forestry 26 years experience
	Paul Podborny	MS Range Management BS Wildlife Ecology 26 years experience
Cultural and Paleontological Resources	Carolyn Sherve-Bybee	MA Anthropology BA German 13 years experience
American Indian Liaison	Elvis Wall	BA History
Fire Management; Fire Ecology	Kyle Teel	BS Agriculture (Wildlife) 16 years experience
Recreation; Visual Resources; Wilderness; Transportation; Off-Highway Vehicles; Special Management Designations	Steve Leslie	BS Park Management 6 years experience
GIS	Matt Wilkin	BS Forestry 26 years experience
Minerals	Lynn Bjorklund	MS Biology BS Biology and Agronomy 15 years experience
	Bill Wilson	BA Geology 34 years experience
Socioeconomics	Tom Crawford	MS Environmental and Natural Resource Economics BS Environmental and Natural Resource Economics 24 years experience
Air Quality	Scott Archer	BS Chemistry, Environmental Science, and Police Administration 23 years experience
Public Affairs	Chris Hanefeld	Associates Degree Applied Arts 18 years experience
BLM – Nevada State Office		
BLM – Washington Office	Mike Pellant	
<b>ENSR EIS Team (Contractor to the Bureau of Land Management)</b>		
Project Management	Drew Ludwig	MS Resource Planning and Conservation MS Zoology BS Zoology 32 years experience



Responsibility	Name	Degree(s) and Experience
	Russ Moore	PhD Ecology BS Range Management 30 years experience
Vegetation, Noxious Weeds; Watershed; Fire	Renee Galeano-Popp	BS Botany 23 years experience
	Russ Moore	PhD Ecology BS Range Management 30 years experience
Woodland Products; Special Status Plants	Jon Alstad	MS Range Science BS Animal Science AA Liberal Arts 20 years experience
Watershed	Heidi Tillquist	MS Environmental Toxicology BS Fisheries and Wildlife 16 years experience
Fisheries; Special Status Species	Rollin Daggett	MS Freshwater and Marine Biology BS Zoology 28 years experience
Cultural Resources; Paleontology	Kim Munson	MA Anthropology BA Anthropology 10 years experience
Ethnography	Clyde Woods	PhD Anthropology MA Anthropology MS Sociology BA Social Science 36 years experience
Socioeconomics	Ron Dutton	MS Economics BS Economics 27 years experience
Public Involvement	Mike Baughman	PhD Environmental Policy MS Agricultural and Resource Economics BS Agricultural and Resource Economics 28 years experience
Fluid Mineral Resources; Hazardous Materials	Bill Berg	MS Geology BS Geology 24 years experience
Mineral Resources; Hydrology	Bob Berry	PhD Geology/Geochemistry Prof. Degree Hydrogeology BS Geology 28 years experience
Wildlife; Special Status Species	Charles Johnson	MA Ecology BS Biology 14 years experience
Range; Wild Horses	Dave Koehler	PhD Range and Forestry MS Ecosystem Ecology BS Range and Forestry 36 years experience
Air	Vince Scheetz	MS Systems Management BS Mathematics 34 years experience



## 6.0 PREPARERS AND REVIEWERS

---

Responsibility	Name	Degree(s) and Experience
Lands and Realty; Special Designations; Renewable Energy; Recreation; Visual Resources; Transportation	Jon McKeon	BA Biology 8 years experience
	Todd White	MCP Community Planning MEn Environmental Science MA Anthropology BA Geology 11 years experience
Soils; Water Resources	Jim Burrell	MS Civil Engineering BS Forest Management 20 years experience
Visual Resources; GIS	Merlyn Paulson	MLA II Landscape Architecture and Geographic Information Systems BLA Landscape Architecture and Environmental Planning 30 years experience
Project Coordination/Technical Editing	Dolora Koontz	BA Biology 15 years experience
	Debby Sehi	BS Environmental Health 11 years experience
WebMaster	Erik Danielson	MS Wildlife and Fisheries Conservation BS Environmental Science 9 years experience



## 6.2 List of Reviewers

Agency	Name	Role
<b>BLM Nevada State Office</b>		
	Brian Amme	NEPA, Planning
	Scott Archer	Air Quality
	Pat Barker	Cultural Resources
	Bill Brookes	Hydrology
	Tom Burke	Cultural Resources
	Erick Campbell	Wildlife
	Tom Crawford	Socioeconomics
	Leo Drumm	Transportation/Recreation
	Robert Gibson	Geology/Minerals
	Sandy Gregory	Fire
	Richard Hoops	Fluid Minerals
	Meg Jensen	NEPA, Planning
	Marguerite McKee	Mapping, GIS
	Randy McNatt	Special Status Species
	John Menghini	Fluid Minerals
	Paul Myers	Socioeconomics
	Mark O'Brien	Mapping, GIS
	Skip Ritter	Woodland Products
	Steve Salzman	Fluid Minerals
	Dennis Samuelson	Lands and Realty
	Gene Seidlitz	NEPA, Planning
	Steve Smith	Recreation, Wilderness
	Larry Steward	Locatable Minerals
	Susie Stokke	Wild Horses
	Rex Wells	Lands and Realty
	Duane Wilson	Range, Livestock
<b>BLM Washington Office</b>		
	Mike Pellant	Planning – assigned to Great Basin Restoration Initiative at Idaho State Office
	Mark Spencer	Planning

Agency	Name	City, State
<b>Cooperating Agencies and Contacts</b>		
Duckwater Shoshone Tribe	Lisa George	Duckwater, Nevada
Ely Shoshone Tribe	Diana Buckner	Ely, Nevada
Great Basin National Park	Jim Schlinkmann	Baker, Nevada
Humboldt-Toiyabe National Forest	Patricia Irwin	Ely, Nevada
Lincoln County	Ronda Hornbeck	Pioche, Nevada
Moapa Band of Paiutes	Ralph Ortegon	Moapa, Nevada
Nellis Air Force Base	Jim Campe	Nellis Air Force Base, Nevada
Nevada Division of Minerals	John Snow	Carson City, Nevada
Nevada Division of Transportation	Kent Cooper	Carson City, Nevada
Nevada Department of Wildlife	Rory Lamp	Elko, Nevada
Nye County	Jim Marble	Tonopah, Nevada
State Historic Preservation Office	Alice Baldrice	Carson City, Nevada
White Pine County	Brent Eldridge	Ely, Nevada
Yomba Shoshone Tribe	Bonnie Bobb	Austin, Nevada



6.0 PREPARERS AND REVIEWERS

Agency	Name	City, State
Other Interested Parties		
Eastern Nevada Landscape Coalition, Science Committee	Janet Bair	Reno, Nevada
	Jeff Englin, Ph.D.	Reno, Nevada
	Tara Forbis, Ph.D.	Ely Nevada
	Jon Haufler, Ph.D.	Seeley Lake, Montana
	John Hiatt, Ph.D.	Las Vegas, Nevada
	Mike Pellant	Boise, Idaho
	Barry Perryman, Ph.D.	Reno, Nevada
	Louis Provencher, Ph.D.	Reno, Nevada
	Doug Ramsey, Ph.D.	Logan, Utah
	Lee Turner, Ph.D.	Ely, Nevada
	Sherm Swanson, Ph.D.	Reno, Nevada
	Bob Wilson	Ely, Nevada
	Peter Weisberg, Ph.D.	Reno, Nevada
Ruby Lake National Wildlife Refuge	Martha Collins	Ruby Valley, Nevada
U.S. Fish and Wildlife Service	Jody Frasier	Reno, Nevada



## GLOSSARY CATEGORIES

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### GLOSSARY

#### GENERAL

**Adaptive Management.** A process for continually improving management policies and practices by learning from outcomes of operation programs and new scientific information.

**Alien Species.** Alien species means, with respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem.

**Assumptions (for analysis).** The supposition that something is true (Webster's). Assumptions are identified at the beginning of the environmental consequences section, and, as needed, at the beginning of the program-specific environmental consequences analysis.

**Best Management Practices.** A set of practices which, when applied during implementation of management actions, ensures that negative impacts to natural resources are minimized. BMP's are applied based on site-specific evaluation and represent the most effective and practical means to achieve management goals for a given site.

**BLM Sensitive Species.** Plant or animal species eligible for federal listed, federal candidate, state listed, or state candidate (plant) status, or approved for this category by the BLM State Director.

**Biological Diversity.** The variety of all forms of life, used herein primarily in a general sense to refer to variety of both species and communities.

**Biomass.** Vegetative material left over from stand treatments. This term usually refers to such material that can be gathered and transported to cogeneration plants, and there utilized for production of electricity.

**Candidate Species.** Those plants and animals included in Federal Register "Notices of Review" that are being considered by the Fish and Wildlife Service for listing as threatened or endangered.

**Cave Resource.** Any naturally occurring void, cavity, recess, or system of interconnected passages beneath the surface of the earth or within a cliff or ledge, including any cave resource therein, that is large enough to permit a person to enter, whether the entrance is excavated or naturally formed. Also included is any natural pit or sinkhole.

**Climate.** The average or prevailing weather conditions of a place over a period of years. (BLM Technical Reference 4400-7)

**Cumulative Effect.** The impact that results from identified actions when they are added to other past, present, and reasonably foreseeable future actions regardless of who undertakes such other actions.



Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

**Desired Range of Conditions.** The expected outcome to be produced by implementation of the identified management actions over the period of time on which this plan is based. Synonymous with Desired Outcomes and Desired Future Conditions.

**Diversity.** 1) The absolute number of species in a community; species richness; 2) A measure of the number of species and their relative abundance in a community; low diversity refers to few species or unequal abundances, high diversity to many species or equal abundances.

**Earnings.** Wages and salaries, other labor income, and proprietor's income (including inventory valuation and capital consumption adjustments).

**Ecological Analysis.** A study and evaluation of the ecological system components and processes present on a given site or geographic area (e.g., watershed) with the intent of identifying 1) the degree to which the components and processes approximate what is considered to be natural and healthy conditions for this type of ecological system, and 2) the causative factors for any observed variations from healthy conditions.

**Ecological Balance (also see Ecological Health).** The conceptual relationship among ecological system components and processes in which the overall ecological system exists in what is considered to be a healthy condition without evidence of ongoing deterioration or changes toward some less healthy state.

**Ecological Benefits.** Improvements in the ecological health, stability, diversity, and/or productivity of an ecological system.

**Ecological Community.** A group of potentially interacting species living in close proximity and commonly recurring under similar conditions of soil, moisture, and topography at other locations within a landscape.

**Ecological Conditions (also see Ecological Health).** The specific attributes of soil, vegetation, water, air, and ecological processes present at a given location; usually used as a synonym for or in reference to changes in ecological health.

**Ecological Disturbance.** Human activities or natural events that affect components or processes in an ecological system, usually in an abrupt manner, resulting in observable changes in the ecological system.

**Ecological Factors.** The individual component items or processes that make up an ecological system, e.g., soil, moisture, exposure, competition, herbivory or predation, disease, etc.

**Ecological Functions.** Any of a wide variety of natural processes that fit within the general definition of ecological processes.



**Ecological Gradients.** The gradual transition in individual ecological factors, especially physical factors, from one location to another.

**Ecological Health.** The degree to which the integrity of the soil, vegetation, water, and air, as well as the ecological processes of an ecological system, are balanced and sustained.

**Ecological Processes.** The flow and cycling of energy, nutrients, and organisms in an ecological system. (see also 43 Code of Federal Regulations 4180.1(b))

**Ecological System.** All the organisms in a particular region and the environment in which they live. The elements interact with each other in some way, and so are depend on each other either directly or indirectly.

**Ecological Zones.** Ecological systems or groups of systems that occupy particular topographic settings that are repeated at other locations of similar topographic settings throughout the region.

**Ecologically Equivalent.** An organism which functions in an ecological system in the same manner and with similar results to another organism even though the two may not be related or possess similar physical characteristics.

**Ecology.** The science of the interrelationships between organisms and their environment; from the Greek “Oikos” meaning “house” or “place to live.”

**Economically Viable.** Possessing the promise of reasonable economic returns following consideration of investment costs and probable economic risks.

**Ecosystem Approach.** The ecosystem approach is the evaluation of the ecological system of both living organisms and non-living components in a defined area. This approach considers the structure, composition, function, and interrelationships of those components, as well as the societal considerations. The term ecosystem approach employs the perspective of different spatial scales with longer or shorter time frames. While the size and temporal consideration of ecological systems may vary, the watershed level is the primary scale of analysis within this RMP/EIS.

**Ecosystem.** The complex of a community of organisms and its environment.

**Ecosystem-based Management.** 1) management driven by explicit goals, executed by policies, protocols, and practices, and made adaptable by monitoring and research based on our best understanding of the ecological interactions and processes necessary to sustain ecosystem composition, structure, and function; 2) any land management system that seeks to protect viable populations of all native species, perpetuate natural-disturbance regimes on the regional scale, adopt a planning timeline of centuries, and allow human use at levels that do not result in long-term ecological degradation.

**Ely District.** The geographic area managed by the Ely Field Office. The area the BLM manages is approximately 11.4 million acres. The area within the boundaries of the District is approximately 13.9 million



acres and includes National Forest, National Park, Department of Defense, Fish and Wildlife Service, state, private, etc.

**Ely Field Office.** The administrative unit of the BLM that manages the Ely District.

**Endangered Species.** Any species defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range and published in the Federal Register.

**Endemic Species.** Native to, and restricted to, a particular geographical region, community type, or specific habitat.

**Enhancement of Habitat for Special Status Animal and Plant Species.** Taking deliberate, proactive measures that are expected to make habitat conditions more productive, diverse, or resilient to disturbances for the benefit of special status animal and plant species.

**Enhancement of Populations of Special Status Animal and Plant Species.** Taking deliberate, proactive measures in cooperation with the Nevada Department of Wildlife or U.S. Fish and Wildlife Service to meet their respective species management goals. For animal species, enhancement means allowing supplemental releases of fish or wildlife into existing populations to increase overall numbers of animals or to improve their genetic health. For plants, enhancement means transplanting or seeding species to supplement existing populations.

**Environmental Assessment.** A systematic analysis of site-specific BLM activities used to determine whether such activities have a significant effect on the quality of the human environment and whether a formal environmental impact statement is required and also to aid an agency's compliance with the National Environmental Policy Act when no EIS is necessary.

**Environmental Impact Statement (EIS).** A formal document to be filed with the Environmental Protection Agency and that considers significant environmental impacts expected from implementation of a major federal action.

**Exotic Species.** An organism or species that is not native to the region in which it is found. Synonym non-native: Not native; alien; a species that has been introduced into an area.

**Extirpation.** The localized disappearance of a species from an area.

**Fragile Ecosystems.** Uncommon ecosystems of limited distribution and size that support unique sensitive/endemic species or communities; ecosystems that have low resilience to environmental stress or to disturbance.

**Geographic Information System (GIS).** A computer system capable of storing, analyzing, and displaying data and describing places on the earth's surface.



**Goal.** Broad statements about desired outcomes (e.g., maintain ecosystem health and productivity). They are not quantifiable.

**Habitat.** The natural abode of a plant or animal, including all biotic, climatic, and edaphic factors affecting life.

**Hazardous Materials.** Anything that poses a substantive present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

**Incomplete or Unavailable Information.** When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an EIS and there is incomplete or unavailable information, the agency shall always make it clear that such information is lacking (Council on Environmental Quality 1502.22). These are identified at the beginning of the environmental consequences section.

**Indicators.** Indicators are observations or measurements of physical, chemical, or biological factors used to evaluate site conditions or trends, appropriate to the potential of the site. Indicators will be used to determine whether or not standards are being met.

**Indigenous.** Living naturally within a given area and was part of the area's flora or fauna prior to human settlement of the region.

**Introduction.** Intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity.

**Maintenance of Habitat for Special Status Animal and Plant Species.** Avoidance or mitigation of projects and land uses so that they cause no new significant adverse impacts on habitats of special status animal and plant species. The quality of the habitat to be maintained is probably variable and may range from poor to excellent. The amount of habitat may be below its potential. Under maintenance management options, especially where habitat quality is low, there is some risk that species may eventually need to be listed under the authority of the Endangered Species Act.

**Maintenance of Populations of Special Status Animal and Plant Species.** Avoidance or mitigation of projects and land uses so that they have no new significant adverse impacts on populations of special status animal and plant species. Populations to be maintained may range from low to high over time and may be below their potential level. Under maintenance management options, especially where populations are small, there is some risk that species may eventually need to be listed under the authority of the Endangered Species Act.

**Management Framework Plan (MFP).** Planning decision document prepared before the effective date of the regulations implementing the land use planning provisions of the FLPMA, which establishes, for a given area of land, land-use allocations, coordination guidelines for multiple-use, and objectives to be achieved for each class of land use or protection.



**Management Guidelines Common to All Alternatives.** Management guidance that applies to any and all of the alternatives, including the No Action and the agency-preferred alternative. These are identified at the beginning of the description of the alternatives.

**Management Objective.** The objectives for which rangeland and rangeland resources are managed which includes specified uses accompanied by a description of the desired vegetation and the expected products and/or values.

**Management Plan.** A program of action designed to reach a given set of objectives.

**Management.** Any actions or activities that are undertaken by the staff of the Ely Field Office that deal with the physical or biological resources found on Public lands within the Ely District or with the use of those resources.

**Monitoring.** Monitoring means the periodic observation and orderly collection of data to evaluate: 1) Effects of management actions; and 2) Effectiveness of actions in meeting management objectives. (43 Code of Federal Regulations 4100.0.5.) The orderly collection, analysis, and interpretation of resource data to evaluate progress toward meeting management objectives. (BLM Technical Reference 4400-7)

**Morphology.** The form and structure of an organism, with special emphasis on external features.

**Multiple Use.** "The management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals watershed, wildlife and fish, natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return of the greatest unit output" (Federal Land Policy and Management Act).

**Multiplier.** A change in an economic measure resulting from a specified change in some other economic measure.

**National Ambient Air Quality Standards.** The allowable concentrations of air pollutants in the ambient (public out-door) air. National ambient air quality standards are based on the air quality criteria and divided into primary standards (allowing an adequate margin of safety to protect the public health) and secondary standards (allowing an adequate margin of safety to protect the public welfare). Welfare is defined as including (but not limited to) effects on soils, water, crops, vegetation, human-made materials, animals, wildlife, weather, visibility, climate, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.



**National Environmental Policy Act of 1969 (NEPA).** NEPA is the basic national charter for protection of the environment. It establishes policy, sets goals, and provides means for carrying out the policy. It also contains action-forcing provisions to ensure that Federal agencies follow the letter and spirit of the Act.

**Native Species.** With respect to a particular ecological system, a species that, other than as a result of an introduction, historically occurred or currently occurs in that ecological system.

**Natural Resources.** These include topography (consider slope and drainage patterns), soil, water courses and/or waterbodies, geological formations, vegetation (consider rare, threatened, or endangered species), and fish and wildlife (consider rare, threatened, or endangered species).

**Naturalized Species.** An exotic or introduced species that has become established and exhibits successful reproduction in an ecosystem.

**Net Value Change.** The sum of the changes resulting from increases (benefits) and decreases (damages) in the value of outputs from the land area affected as the consequences of fire. An average dollar value per acre is assigned based on the change to all resources including range, watershed, wildlife, soils, and recreation.

**Objective.** Objectives identify specific desired conditions for resources. They can be quantified and measured and may have established timeframes for achievement (e.g., manage vegetative communities on the upland portion of the Clear Creek watershed to achieve by 2020 an average 30 to 40 percent canopy cover of sagebrush).

**Permit.** Authorization in writing by the authorized officer or other person authorized by the U.S. Government, and is a contract between the permittee and the U.S.

**Personal Income.** Employee compensation plus property income.

**Physiographic Province.** A geographic region with similar climatic, land form, and geologic features, and which is significantly different from adjacent regions.

**Planning Criteria.** Guidelines for the planning effort that serve as the sideboards.

**Productivity.** The potential rate of incorporation or generation of energy or organic matter (biomass) by an organism, population or trophic unit per unit time per unit area; plant productivity is termed primary production, and animal productivity is termed secondary production.

**Rangeland Health.** The degree to which the integrity of the soil and the ecological processes of rangeland ecosystems are sustained.



**Resistance.** The ability to resist; especially, the inherent capacity of a living organism (or assemblage of organisms) to resist external forces and adverse circumstances such as disease, drought, lack of nourishment, or toxic agents.

**Resource.** Any component of the environment that can be utilized by an organism.

**Resource Advisory Council.** A citizen-based group of 10 to 15 members chartered under the Federal Advisory Committee Act and appointed by the Secretary of the Interior to forward advice on public land planning and management issues to the BLM. Council membership reflects a balance of various interests concerned with the management of the public lands and users of the public lands.

**Resource Management Plan (RMP).** A BLM multiple-use planning document, prepared in accordance with Section 202 of the Federal Land Policy and Management Act, that:

- Establishes resource conditions goals and objectives to be attained;
- Allocates resources and identifies allowable uses;
- Identifies land area for limited, restrictive, or exclusive uses; and
- Provides guidance for implementation of the decisions made in the plan.

**Restoration of Habitat for Special Status Animal and Plant Species.** Taking deliberate, proactive measures to reestablish habitat suitable for supporting special status animal and plant species.

**Restoration of Populations of Special Status Animal and Plant Species.** Taking deliberate, proactive measures in cooperation with the Nevada Department of Wildlife or U.S. Fish and Wildlife Service to meet their respective species management goals. Restoration means reestablishing a species into a currently unoccupied suitable area.

**Sensitive Species.** All species that are under status review, have small or declining populations, live in unique habitats, or need special management. Sensitive species include threatened, endangered, and proposed species as classified by the Fish and Wildlife Service and National Marine Fisheries Service.

**Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. For example, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

**Special Status Species.** Plant or animal species known or suspected to be limited in distribution, rare or uncommon within a specific area, and/or vulnerable to activities that may affect their survival.

**Species.** A taxon of the rank species; which is the basic unit, and lowest principal category, of biological classification; in the hierarchy of biological classification, the category below genus; a group of organisms formally recognized as distinct from other groups.



**Stakeholders.** Stakeholders means, but is not limited to, state, Tribal, and local government agencies, academic institutions, the scientific community, nongovernmental entities including environmental, agricultural, and conservation organizations, trade groups, commercial interests, and private landowners.

**Standard Operating Procedures.** Synonymous with “mitigating measures”; a standard operating procedure would mitigate a potential impact. These are actions that the Ely Field Office automatically takes as part of a management action or project (e.g., flagging a new fence for visibility by wildlife and horses). These may be common to all alternatives.

**Standards.** The goal to be strived for.

**Sustainability.** The ability to maintain diversity, productivity, resilience to stress, health, renewability, and yields of desired values, resource uses, products, or services over time in an ecosystem while maintaining its integrity.

**Threatened Species.** Any plant or animal species defined under the Endangered Species Act as likely to become endangered within the foreseeable future throughout all or a significant portion of its range; listings are published in the Federal Register.

**Trend.** The direction of change over time, either toward or away from desired management objectives.

**Upland.** Terrestrial ecosystems located away from riparian zones, wetlands, springs, seeps and dry washes; ecosystems made up of vegetation not in contact with groundwater or other permanent water sources.

**Urban Interface.** An area where urban encroachment into adjacent wildland areas is increasing the complexity and magnitude of problems related to all aspects of natural resource management and protection, including increased fire risks, unauthorized use, and littering.

## CULTURAL

**Archaeological Site.** A geographic locale that contains the material remains of prehistoric and/or historic human activity.

**Archaeology.** The reconstruction of past cultures through their material remains and the study of how cultures change over time.

**Conservation for Future Use.** This category is reserved for any unusual cultural property which, because of scarcity, a research potential that surpasses the current state of the art, singular historic importance, cultural importance, architectural interest, or comparable reasons, is not currently available for consideration as the subject of scientific or historical study that would result in its physical alteration. A cultural property included in this category is deemed worthy of segregation from all other land or resource uses, including



cultural resources uses that would threaten the maintenance of its present condition or setting, as pertinent, and will remain in this use category until specified provisions are met in the future.

- Where the primary allocation is to Conservation for Future Use:
  - Data recovery would not be permitted
  - Scientific Use would only occur when non-destructive
  - Experimental Use would be incompatible with Conservation for Future Use
  - No new actions would be approved that would require data recovery or diminish the scientific value of the resource

**Cultural Property.** A definite location of past human activity, occupation, or use identifiable through field inventory (survey), historical documentation, or oral evidence (BLM Manual 8100).

**Cultural Resources.** A broad, general term meaning any cultural property and any traditional lifeway value (BLM Manual 8100).

**Discharged from Management.** This category is assigned to cultural properties that have no remaining identifiable use. Most often these are prehistoric and historic archaeological properties, such as small surface scatters of artifacts or debris, whose limited research potential is effectively exhausted as soon as they have been documented. Also, more complex archaeological properties that have had their salient information collected and preserved through mitigation or research may be discharged from management, as should cultural properties destroyed by any natural event or human activity. Properties discharged from management remain in the inventory, but they are removed from further management attention and do not constrain other land uses. Particular classes of unrecorded cultural properties may be named and described in advance as dischargeable upon documentation, but specific cultural properties must be inspected in the field and recorded before they may be discharged from management.

**Experimental Use.** This category may be applied to a cultural property judged well-suited for controlled experimental study, to be conducted by BLM or others concerned with the techniques of managing cultural properties, which would result in the property's alteration, possibly including loss of integrity and destruction of physical elements. Committing cultural properties or the data they contain to loss must be justified in terms of specific information that would be gained and how it would aid in the management of other cultural properties. Experimental study should aim toward understanding the kinds and rates of natural or human-caused deterioration, testing the effectiveness of protection measures, or developing new research or interpretation methods and similar kinds of practical management information. It should not be applied to cultural properties with strong research potential, traditional cultural importance, or good public use potential, if it would substantially diminish those uses.

**Historic.** Period wherein nonnative cultural activities took place, based primarily upon European roots, having no origin in the traditional Native American culture(s).

**Historic Property or Historic Resource.** "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register. The term includes, for purposes of these regulations, artifacts, records, and remains that are related to and located within such properties. The term 'eligible for inclusion in the National Register' includes both properties formally determined as such by the



Secretary of the Interior and all other proper-ties that meet National Register listing criteria” {quoted from 36 CFR 900.2(e)}.

**National Register of Historic Places.** A register of districts, sites, buildings, structures, and objects, significant in American history, architecture, archaeology and culture, established by the “Historic Preservation Act” of 1966 and maintained by the Secretary of the Interior.

**Paleontology.** The study of fossils; what fossils tell us about the ecologies of the past, about evolution, and about our place, as humans, in the world. Informs us about interrelationship between the biological and geological components of ecosystems over time.

**Public Use.** This category may be applied to any cultural property found to be appropriate for use as an interpretative exhibit in place, or for related educational and recreational uses by members of the general public. The category may also be applied to buildings suitable for continued use or adaptive use, for example, as staff housing or administrative facilities at a visitor contact or interpretative site, or as shelter along a cross-country ski trail. Criteria to recognize Public Use at an archaeological/historic site:

- Physical evidence of public use at an archaeological site
  - evidence of display piles
  - trash
  - fire rings/campfires
  - tire tracks leading to site
  - visitor trails through site
- Monitoring of site by volunteers
- Location identified on public maps and websites, in guidebooks and newsletters

**Rock Art.** Petroglyphs or pictographs.

**Sacred site.** Any specific, discrete, narrowly delineated location of federal land that is identified by an Indian tribe, or individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site (quoted from Executive Order 13007, Section 7 1(b)(iii)).

**Scientific Use.** This category applies to any cultural property determined to be available for scientific or historical study using currently available research techniques, including methods that would result in the property’s physical alternation or destruction. The category applies almost entirely to prehistoric and historic archaeological properties, where the method of use is generally archaeological excavation, controlled surface collection, and/or controlled recordation (data recovery). Recommendations to allocate individual properties to this use must be based on documentation of the kinds of data the property is thought to contain and the data’s importance for pursuing specified research topics. Properties in this category need not be conserved in the face of a research or data recovery (mitigation) proposal that would make adequate and appropriate use of the property’s research importance.



**Traditional Cultural Property.** A cultural property that derives significance from traditional lifeway values associated with it. A traditional cultural property may qualify for the National Register if it meets the criteria and criteria exceptions at 36 Code of Federal Regulations 60.4 (BLM Manual 8100 – The Foundations for Managing Cultural Resources, page 34).

**Traditional Lifeway Values.** The quality of being useful in or important to the maintenance of a specified social and/or cultural group's traditional systems of (a) religious belief, (b) cultural practice, or (c) social interaction, not closely identified with definite locations. Another group's shared values are abstract, nonmaterial, ascribed ideas that one cannot know about without being told (BLM Manual 8100).

**Traditional Use.** This category is to be applied to any cultural resource known to be perceived by a specified social and/or cultural group as important in maintaining the cultural identity, heritage, or well-being of the group. Cultural properties assigned to this category are to be maintained in ways that recognize the importance ascribed to them and seek to accommodate their continuing traditional use.

## **FIRE**

**Appropriate Management Response.** Specific actions taken in response to a wildland fire to implement protection and fire use objectives.

**Emergency Stabilization.** Actions taken immediately following a fire event to 1) stabilize soils against erosion, 2) protect threatened and endangered species habitats against further degradation, 3) prevent further damage to known fire-damaged historic properties, and 4) prevent invasive plant establishment.

**Escaped Fire.** A fire that has exceeded initial attack capabilities.

**Fire Effects.** The physical, biological, and ecological impact of fire on the environment.

**Fire Intensity.** The product of the available heat of combustion per unit area of ground and the rate of spread of the fire.

**Fire Management Area.** One or more parcels of land having a common set of fire management objectives.

**Fire Regime.** Periodicity and pattern of naturally occurring fire in a particular area or vegetative type, described in terms of frequency, biological severity, and area extent (Society of American Foresters 1996).

**Fire Return Interval.** The number of years between two successive fires documented in a designated area (such as the interval between two successive fire occurrences).

**Fire Strategy.** An overall plan of action for fighting a fire that gives regard to the most cost-efficient use of personnel and equipment in consideration of values threatened, fire behavior, legal constraints, and objectives established for resource management. Leaves decisions on the tactical use of personnel and equipment to line commanders in the suppression function.



**Fire Suppression.** All the work activities connected with fire-extinguishing operations, beginning with the discovery and continuing until the fire is completely extinguished.

**Fire Use (Managed Natural Fire).** Any fire ignited by natural means, such as lightning, which is managed for resource benefits.

**Fuel Type.** An identification association of fuel elements of distinctive species, form, size, arrangement or other characteristics that will cause a predictable rate of spread or resistance to control under specific weather conditions.

**Fuels.** Includes living and dead plant materials that are capable of burning.

**Greenstripping.** The practice of establishing or using patterns of fire-resilient vegetation and/or material to reduce wildfire occurrence and size. Examples are establishing fire-resilient vegetation adjacent to roads or railways, around or interspersed in valuable shrub stands, or within large blocks of flash fuels.

**Phase 1 Fire Planning.** The first phase of a two-stage fire management planning process that identifies desired resource conditions and fire management direction, including fire management strategies, which will promote achievement of resource objectives.

**Prescribed Burning.** Controlled application of fire to wildland fuels in either their natural or modified state, under specified environmental conditions that allow the fire to be confined to a predetermined area and at the same time to produce the fire line intensity and rate of spread required to attain planned resource management objectives.

**Prescribed Fire.** Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and National Environmental Policy Act requirements must be met, prior to ignition.

**Rehabilitation.** The activities necessary to repair damage or disturbance caused by wildfire or the fire suppression activity.

**Risk Assessment.** Assessing the chance of fire starting, natural or human-caused, and its potential risk to life, resources, and property.

**Values-at-risk.** Any or all natural resources, improvements, or other values that may be jeopardized if a fire occurs (value-at-risk, risk of resource values).

**Wildfire.** Any fire occurring on wildland that is not meeting management objectives and thus requires a suppression response. An unwanted wildland fire.



**Wildland Fire Implementation Plan.** A decision-making process that evaluates alternative management strategies against selected safety, environmental, social, economical, political, and resource management objectives as selected criteria for the management of fire use.

**Wildland Fire Situation Analysis.** A decision-making process that evaluates alternative management strategies against selected safety, environmental, social, economical, political, and resource management objectives as selection criteria for suppression of a fire.

**Wildland Fire.** Any nonstructure fire, other than prescribed fire, that occurs in the wildland.

**Wildland Urban Interface.** The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetation fuels.

## **GEOLOGY AND MINERALS**

**Alluvium.** Material deposited on the land by water, such as sand, silt, or clay.

**Badlands.** Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels, most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

**Clay (Geology).** A rock or mineral fragment of any composition finer than 0.00016 inches in diameter. Mineral: A hydrous aluminum-silicate that occurs as microscopic plates, and commonly has the ability to absorb substantial quantities of water on the surface of the plates.

**Erosion (Geologic).** Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains; synonymous with *natural erosion*.

**Fluvial (Fluviatile) Deposit.** A sedimentary deposit laid down, transported by, or suspended in, a stream.

**Graben.** A fault-bounded down-dropped portion of the Earth's crust.

**Hot-springs Deposit.** A type of hydrothermal deposit formed in a hot-springs environment.

**Hydrothermal Deposit.** A mineral deposit formed by hot, mineral-laden fluids.

**Igneous Rock.** Rock that solidified from a molten or semimolten state. The major varieties include intrusive (solidified beneath the surface of the Earth) and volcanic (solidified on or very near the surface of the Earth).

**Known Geothermal Resource Area.** "An area in which the geology, nearby discoveries, competitive interest, or other indicia would, in the opinion of the Secretary, engender the belief in men who are



experienced in the subject matter that the prospect for extraction of geothermal stream or associated geothermal resources are good enough to warrant expenditures or money for that purpose” [43 Code of Federal Regulations 3200.0-5(k)].

**Lacustrine Deposit (Geology).** Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

**Limestone.** A sedimentary rock consisting chiefly of calcium carbonate.

**Magma.** Molten rock from within the Earth capable of flowing like liquid.

**Metamorphosed.** Rock that has been altered in composition, texture, or structure by heat and/or pressure.

**Porphyry Deposit.** A large, low-grade metallic mineral deposit containing disseminated sulfide minerals (examples: copper, gold, molybdenum, or tin).

**Rhyolite.** A fine-grained light-colored silica-rich igneous rock composed largely of potash feldspars and quartz.

**Sand.** (geology) A rock fragment or detrital particle between 0.0025 and 0.08 inches in diameter.

**Schist.** A metamorphic rock characterized by coarse-grained minerals oriented approximately parallel.

**Silt (Geology).** A rock fragment or detrital particle smaller than very fine sand and larger than coarse clay, ranging from 0.0024 to 0.00016 inches in diameter and commonly having a high content of clay minerals.

**Slate.** A compact, fine-grained, platy metamorphic rock formed from shale or claystone.

**Special Stipulation.** A specific operating condition or limitation added to a mineral lease to protect sensitive resources. It modifies the original terms and conditions of that lease.

**Terrace (geologic).** An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

**Upland (geology).** Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

**Valid Existing Rights.** Locatable mineral development rights that existed when the Federal Land Policy and Management Act was enacted on October 21, 1976. Some areas are segregated from entry and location under the Mining Law to protect certain values or allow certain uses. Mining claims that existed as of the effective date of the segregation may still be valid if they can meet the test of discovery of a valuable mineral required under the Mining Law. Determining the validity of mining claims located in segregated lands requires BLM to conduct a validity examination and is called a “valid existing rights” determination.



## **GRAZING**

**Active Use.** The current authorized use, including livestock grazing and conservation use. Active use may constitute a portion, or all, of permitted use. Active use does not include temporary nonuse or suspended use of forage within all or a portion of an allotment.

**Actual Use Data.** The number of livestock, kind or class of those livestock, and time period those livestock actually grazed a specific allotment or pasture.

**Animal Unit.** One cow, one cow/calf pair, one horse, or five sheep.

**Animal Unit Month.** The forage needed to support one cow, one cow/calf pair, one horse, or five sheep for one month. Approximately 800 pounds of forage.

**Authorized Use.** This is the amount of use a permittee is billed for (the bill is the authorization to graze). It may or may not be the total active use. Example: If a permittee has 500 animal unit months of active use, he may only be authorized 300 animal unit months for a certain year, but cannot be authorized above 500 animal unit months. This changes from year to year, based on fluctuation of the permittees livestock herd, vegetation production, drought, etc.

**Deferred Grazing.** Discontinuance of grazing by livestock on an area for a specified period of time during the growing season to promote plant growth, reproduction, establishment of new plants, or restoration of vigor by old plants.

**Deferred Rotation Grazing.** Discontinuance of grazing on various parts of a range in succeeding years, allowing each part to rest successively during the growing season to permit seed production, establishment of seedlings, or restoration of plant vigor. Two, but usually three or more, separate units are required. Control is usually insured by unit fencing, but may be obtained by camp unit herding.

**Distribution (Grazing).** Dispersion of grazing animals within a management unit or area.

**Ecological Site Inventory.** The basic inventory of present and potential vegetation on BLM rangelands. Ecological sites are differentiated on the basis of the kind, proportion, or amount of plant species.

**Forage.** The plant material actually consumed by (or available to) grazing animals.

**Grazing Distribution.** Dispersion of livestock grazing within a management unit or area.

**Guidelines.** Guidelines are livestock management practices (e.g., tools, methods, strategies, and techniques) designed to achieve healthy public lands as defined by Standards and portrayed by Indicators. Guidelines are designed to provide direction, yet offer flexibility for local implementation through activity plans and grazing permits. Activity plans may add specificity to the Guidelines based on local goals and objectives as provided for in adopted manuals, handbooks, and policy. Not all Guidelines fit all



circumstances. Monitoring or site specific evaluation will determine if significant progress is being made towards achieving the Standards, and if the appropriate Guidelines are being applied.

**Intensity (Grazing).** A reference to grazing density per unit of time.

**Performance-based Grazing Management (Conservation Partnerships).** A voluntary arrangement in which a grazing permit holder enters into a performance-based agreement with the agency aimed at promoting ecological health of an allotment. Performance-based actions would include those that help restore stream banks and wetlands, enhance water quality and quantity, improve wildlife habitat, and promote recovery of special status species. In return the permittee receives greater management flexibility and the potential for increased livestock grazing made possible by success in the conservation efforts.

**Permitted Use.** The forage allocated by, or under the guidance of, an applicable land use plan for livestock grazing in an allotment under a permit or lease and is expressed in animal unit months.

**Range Improvement.** Range improvement means an authorized physical modification or treatment that is designed to improve production of forage; change vegetation composition; control patterns of use; provide water; stabilize soil and water conditions; restore, protect and improve the condition of rangeland ecosystems to benefit livestock, wild horses, and fish and wildlife. The term includes but is not limited to, structures, treatment projects, and use of mechanical devices or modifications achieved through mechanical means.

**Range Site.** An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

**Rangeland.** Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

**Residual Vegetation.** Amount, cover, and species composition of the vegetation on a site after it has been grazed for a period of time.

**Rest-rotation Grazing.** An intensive system of management whereby grazing is deferred on various parts of the range during succeeding years, allowing the deferred part complete rest for one year. Two or more units are required. Control by fencing is usually necessary on cattle range, but may be obtained by herding on sheep ranges.

**Surface Characteristics.** The amount of bare ground, litter, rock, and basal cover of live vegetation, which may include cryptograms (Nevada Rangeland Monitoring Handbook).



**Sustained Yield.** “The achievement and maintenance in perpetuity of a high level annual or regular periodic output of the various renewable resources of the public lands consistent with multiple use” (Federal Land Policy and Management Act of 1976).

## **LANDS AND SPECIAL DESIGNATIONS**

**Access.** The physical ability to have legal ingress to and egress from public lands via public roads or on routes having public easements.

**Acquired Lands.** Lands acquired for BLM administration in various ways, such as but not limited to: 1) any lands purchased by congressionally appropriated funds, 2) land donations, 3) land exchanges, 4) Land and Water Conservation Fund acquisitions, 5) land withdrawals returned to public land status through withdrawal revocations and/or relinquishments, etc., 6) split-estate acquisitions, 7) federal agency jurisdictional transfers, 8) easement acquisitions, and/or 9) lands acquired by any other means.

**Area Of Critical Environmental Concern (ACEC).** Area where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect humans from natural hazards.

**Avoidance Areas.** Areas with sensitive resource values where rights-of-way would be strongly discouraged. Authorizations made in avoidance areas would have to be compatible with the purpose for which the area was designated and not be otherwise feasible on lands outside the avoidance area.

**Back-country Byway.** Vehicle routes that traverse scenic corridors utilizing secondary or back-country road systems. National back-country byways are designated by the type of road and vehicle needed to travel the byway.

**Closed.** Generally denotes that an area is not available for a particular use or uses; refer to specific definitions found in law, regulations, or policy guidance for application to individual programs.

**Corridor.** A wide strip of land within which a proposed linear facility could be located.

**Designated Corridor.** A parcel of land identified by law, Secretarial order, through a land use plan or by other management decision as being the preferred location for existing and future right-of-way grants and suitable to accommodate one type of right-of-way or one or more rights-of-way that are similar, identical or compatible.

**Designated Roads and Trails.** Specific roads and trails identified by the agencies where some type of motorized vehicle use is appropriate and allowed either seasonally or yearlong.

**Designation.** The approval of a resource management plan, plan revision, or plan amendment constitutes formal designation of off-highway vehicle use areas.



**Exclusion Areas.** Areas with sensitive resource values where rights-of-way would be prohibited.

**Extensive Recreation Management Area.** Area where recreation management is less structured (than within a special recreation management area) and recreation use more dispersed with minimal regulatory constraints and where minimal recreation-related investments are required.

**High Resource Values.** Lands with high resource values are considered to be public lands that have the caliber of resources to qualify them for inclusion in special management areas such as ACECs, National Wild and Scenic Rivers, Wilderness Study Areas, and high resource areas such as critical wildlife habitat areas, wild horse herd areas, critical fish habitat areas, cultural site areas, threatened and endangered species habitats, etc. Long-term retention of Public lands in these special management areas is either required by law through Congressional action or identified through the land use planning process.

**Integrated Use.** To merge the use of each type of public land use through a series of land management practices.

**Interim Management Policy.** Policy for managing public lands under wilderness review. Section 603 (c) of the Federal Land Policy and Management Act of 1976 states: "During the period of review of such areas and until Congress has determined otherwise, the Secretary shall continue to manage such lands according to his authority under this Act and other applicable law in a manner so as not to impair the suitability of such areas for preservation as wilderness, subject, however, to the continuation of existing mining and grazing uses and mineral leasing in the manner and degree in which the same was being conducted on the date of approval of this Act: Provided, that, in managing the public lands the Secretary shall by regulation or otherwise take any action required to prevent unnecessary or undue degradation of the lands and their resources or to afford environmental protection."

**Land Use Allocations.** Allocations that define allowable uses/activities, restricted uses/activities, and prohibited uses/activities. They may be expressed in terms of area such as acres or miles. Each allocation is associated with a specific management objective.

**Land Use Plan.** Land use plan means a resource management plan, developed under the provisions of 43 Code of Federal Regulations part 1600, or management framework plan. These plans are developed through public participation in accordance with the provisions of the Federal Land Policy and Management Act of 1976 and establish management direction for resource uses of public lands. (43 Code of Federal Regulations 4100)

**Limits of Acceptable Change.** For recreation management, a nine-step process used to define the desired resource conditions for an area and to determine acceptable levels of resource change due to recreation use. The process helps to develop management actions to avoid exceeding standards.

**Mechanized Vehicle.** Any non-motorized vehicle capable of or designed for travel on land. An example of a mechanized vehicle is a mountain bike.



**Naturalness (a primary wilderness value).** An area that generally appears to have been affected primarily by the forces of nature with the imprint of people's work substantially unnoticeable.

**Off-highway Vehicle.** A vehicle that can be operated off of improved and regularly maintained roads with hardened or gravel surfaces.

**Off-highway Vehicle Designation:**

- **Open:** Designated areas and trails where off-highway vehicles may be operated subject to operating regulations and vehicle standards set forth in BLM Manuals 834I and 8343.
- **Limited:** Designated areas and trails where off-highway vehicles are subject to restrictions limiting the number or types of vehicles, date, and time of use; limited to existing or designated roads and trails.
- **Closed:** Areas and trails where the use of off-highway vehicles is permanently or temporarily prohibited. Emergency use is allowed.

**Off-Highway Vehicle Emphasis Area.** A special recreation management area that emphasizes motorized recreation over other recreational opportunities. These are not designated off-highway vehicle open areas. Within the special recreation management area, trails and routes would be designated for motorized recreational opportunities. Off-road motorized travel would not be permitted for recreational purposes.

**Patent.** The instrument by which the Federal Government conveys title to the public lands.

**Primary Wilderness Values.** The primary or key wilderness values described in the "Wilderness Act" by which Wilderness Study Areas and designated wilderness are managed to protect and enhance the wilderness resource. Values include roadlessness, naturalness, solitude, primitive and unconfined recreation, and size.

**Primitive and Unconfined Recreation (a primary wilderness value).** Nonmotorized and undeveloped types of outdoor recreation activities. Refers to wilderness recreation opportunities, such as nature study, hiking, photography, backpacking, fishing, hunting, and other related activities. Does not include the use of motorized vehicles, bicycles, or other mechanized means of travel.

**Public Land.** Any land or interest in land owned by the U.S. and administered by the Secretary of the Interior through the BLM.

**Recreation Opportunity Spectrum.** A means of characterizing recreation opportunities in terms of setting, activity, and experience opportunities.

**Recreation Site.** An area where management actions are required to provide a specific recreation setting and activity opportunities, to protect resource values, provide public visitor safety and health, and/or to meet



public recreational use demands and recreation partnership commitments. A site may or may not have permanent facilities.

**Research Natural Area.** An area where natural processes predominate and which is preserved for research and education. Under current BLM policy, these areas must meet the relevance and importance criteria of ACEC's and are designated as ACEC's.

**Right-of-way.** A permit or an easement authorizing the use of public land for certain specified purposes, commonly for pipelines, roads, telephone lines, electric lines, reservoirs, etc. Also, the reference to the land covered by such an easement or permit.

**Road.** Travel route that has been improved and maintained by mechanical means to ensure relatively regular and continuous use.

**Rural Interface Areas.** Areas where BLM-administered lands are adjacent to or intermingled with privately owned lands zoned for 1- to 20-acre lots, or areas that already have residential development.

**Solitude (a primary wilderness value).** The state of being alone or remote from habitations; a lonely, unfrequented, or secluded place. The intent is to evaluate the opportunity for solitude in comparison to habitations of people.

**Special Recreation Management Area.** An area where recreation is one of the principal management objectives, where intensive recreation management is needed, and where more than minimal recreation-related investments are required.

**Special Recreation Permit.** Authorizations, which allow for recreational uses of the public lands and related waters. They are issued as a means to control visitor use, protect recreational and natural resources, provide for the health and safety of visitors, and as a mechanism to accommodate commercial recreational use of public lands.

**Trail.** A pathway usually created and maintained by human foot traffic, beasts-of-burden, livestock, or wildlife.

**Visit.** A unit of measure for evaluating the amount of recreational activity on public land; equivalent to one person spending any part of a day recreating on Public land.

**Visual Resource Management Classes.** A classification of landscapes according to the kinds of structures and changes that are acceptable to meet established visual goals (BLM).

**Visual Resources.** The visible physical features of a landscape (topography, water, vegetation, animals, structures, and other features) that constitute the scenery of an area.



**Way.** A trace maintained solely by the passage of vehicles which has not been improved and/or maintained by mechanical means to ensure relatively regular and continuous use.

**Wilderness Inventory.** A written description of resource information and data, and a map of those public lands that meet the wilderness criteria as established under Section 603 (a) of the Federal Land Policy and Management Act of 1976 and Section 2 (c) of "The Wilderness Act."

**Wilderness Study Area.** A roadless area or island that has been inventoried and found to have wilderness characteristics as described in section 603 of the Federal Land Policy and Management Act of 1976 and section 2 (c) of "The Wilderness Act." Wilderness Study Areas were administratively designated by BLM following evaluation of wilderness inventories.

**Withdrawal.** A withdrawal is a formal action that transfers total or partial jurisdiction of federal land between federal agencies, segregates (closes) federal land to some or all of the public land laws and/or mineral laws, or dedicates land for a specific public purpose. There are three major categories: Congressional, administrative, and Federal Energy Regulatory Commission withdrawals.

## **SOIL**

**Association, Soil.** A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single soil map unit.

**Biological (Cryptogamic) Soil or Crust.** Community of non-vascular primary producers that occur as a "crust" on the surface of soils; made up of a mixture of algae, lichens, mosses, and cyanobacteria (bluegreen algae).

**Calcareous Soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

**Classification, Soil.** The systematic arrangement of soils into groups or categories on the basis of their characteristics.

**Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

**Clayey Soil.** Silty clay, sandy clay, or clay.

**Coarse Textured Soil.** Sand or loamy sand.

**Colluvium.** Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

**Compaction, Soil.** An increase in soil bulk density of 15 percent or more from the undisturbed level.



**Complex, Soil.** A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

**Cryptogamic Crust.** See microbiotic crust.

**Erosion.** (v.) Detachment and movement of soil or rock fragments by water, wind, ice, or gravity. (n.) The land surface worn away by running water, wind, ice, or other geologic agents, including such processes as gravitational creep.

**Erosion (Accelerated).** Erosion much more rapid than geologic erosion, occurring mainly as a result of human or animal activities or of a catastrophe in nature, such as with fire, that exposes the surface.

**Fertility, Soil.** The quality that enables a soil to provide plant nutrients in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

**Fine Textured Soil.** Sandy clay, silty clay, or clay.

**Functionality, Soil.** The maintaining of soil structure and texture characteristics, such as aeration, temperature, moisture, nutrition and the organisms that live in the soil.

**Gravel.** (Geology) Unconsolidated, rounded rock fragments greater than 0.08 inch in diameter. Sizes range from pebbles (0.008 to 2.5 inches) to cobbles (2.5 to 10 inches) to boulders (greater than 10 inches).

**Horizon, Soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes.

**Loam.** Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

**Map Unit.** The basic system of description in a soil survey and delineation on a soil map. Can vary in level of detail.

**Medium Textured Soil.** Very fine sandy loam, loam, silt loam, or silt.

**Microbiotic Crust.** Lichens, mosses, green algae, fungi, cyanobacteria, and bacteria growing on or just below the surface of soils.

**Order 3 Soil Survey.** A reconnaissance survey with extensive ground truthing. Minimum delineation sizes are typically on the order of 40 to 80 acres.



**Organic Matter.** Plant and animal residue in the soil in various stages of decomposition.

**Permeability.** The quality of the soil that enables water to move downward through the profile, measured as the number of inches per hour that water moves downward through the saturated soil.

**pH Value.** A numerical designation of acidity and alkalinity in soil (see “reaction, soil”).

**Productivity, Soil.** The organic fertility or capacity of a given area or habitat.

**Profile, Soil.** A vertical section of the soil extending through all its horizons and into the parent material.

**Saline Soil.** A soil containing soluble salts in an amount that impairs the growth of plants. A saline soil does not contain excess exchangeable sodium.

**Sediment.** Soil, rock particles, and organic or other debris carried from one place to another by wind, water or gravity.

**Series, Soil.** A nationally defined soil type set apart on distinct soil properties that affect use and management. In a soil survey, this includes a group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

**Silt (Soil).** Individual mineral particles ranging in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class: Soil that is 80 percent or more silt and less than 12 percent clay.

**Sodic (alkali) Soil.** A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

**Soil.** 1) The unconsolidated mineral and organic material on the immediate surface of the earth that serves as a natural medium for the growth of land plants; 2) the unconsolidated mineral matter on the surface of the earth that has been subjected to and influenced by genetic and environmental factors of parent material, climate (including moisture and temperature effects), macro- and micro-organisms, and topography, all acting over a period of time and producing a product -soil- that differs from the material it was derived in many physical, chemical, biological, and morphological properties and characteristics.

**Structure, Soil.** The arrangement of primary soil particles into compound particles or aggregates.

**Survey, Soil.** A field investigation resulting in a soil map showing the geographic distribution of various kinds of soil and an accompanying report that describes the soil types and interprets the findings.

**Texture, Soil.** The relative proportions of sand, silt, and clay particles in a mass of soil.



### VEGETATION AND WOODLANDS

**Active Restoration.** Vegetation treatments that involve direct physical or chemical alteration of vegetation communities on a given site. These treatments may include use of tools such as chaining, burning, herbicide application, tree cutting, plowing, and seeding.

**Active Treatment.** Treatment methods which involve major and substantive changes in vegetation communities, typically accompanied by extensive disturbance of the soil surface and primarily resulting from mechanical, chemical, or fire application (e.g., chaining, plowing, sawing, seeding, prescribed fire, managed wildfire, herbicides). Effects typically become apparent immediately or over very short period of time, generally less than one or two growing seasons.

**Annual Growth.** The amount of production of new above-ground plant biomass for a given site during a given year.

**Attribute.** A discreet feature or characteristic of biotic or physical resources that can be measured (example: plant density, which is the number of individuals or stems per unit area).

**Canopy Cover.** The percentage of ground covered by a vertical projection of the outermost perimeter of the natural spread of foliage of plants. Small openings within the canopy are included. (BLM Technical Reference 4400-7)

**Community Structure.** Refers to the presence of multiple plant life forms (trees, shrubs, grasses, and forbs) and their relative abundance within a given vegetation community.

**Conifer.** A tree of the order Coniferae with cones and needle-shaped or scale-like leaves.

**Control.** Control means, as appropriate, eradicating, suppressing, reducing, or managing invasive species populations, preventing spread of invasive species from areas where they are present, and taking steps such as restoration of native species and habitats to reduce the effects of invasive species and to prevent further invasions.

**Desired Natural Plant Community.** The type of plant community which is desired for a particular ecological site. This could include native and non-native species depending on the desired land use, but as a natural plant community it must have native species adapted to the climate and soil type as dominants or co-dominants in the community.

**Desired Plant Community.** Of the several plant communities that may occupy a site, the one that has been identified through a management plan to best meet the plan's objectives for the site. It must protect the site as a minimum.



**Deterioration or Decline (of vegetation communities).** A pattern of changes in vegetation communities leading to loss of perennial understory species, reduction in overall species diversity, increase in shrub or tree dominance in communities that are not naturally shrublands or woodlands. These changes indicate that the vegetation community is approaching or undergoing a transition to another vegetation state from which conditions are not easily reversible.

**Diameter at Breast Height (DBH).** The diameter of a tree measured 4.5 feet above the ground.

**Ecological Site Condition.** See ecological status.

**Ecological Status.** The present state of vegetation of a range site in relation to the potential natural community for that site. Four classes are used to express the degree to which the production or composition of the present plant community reflects that of the potential natural community (climax):

Ecological Status (Seral stage)	Percent of Community in Climax Condition
Potential natural community	76–100
Late seral	51–75
Mid-seral	26–50
Early seral	0–25

**Forb.** Any herbaceous plant not a grass or a grasslike species.

**Forest Health.** The condition in which forest ecosystems sustain their complexity, diversity, resiliency, and productivity while providing for human needs and values.

**Fragmentation.** Process of reducing the size and connectivity of vegetated stands and/or habitat that comprise a rangeland or forest; a measure of connectivity in vegetative and/or habitat conditions across a landscape.

**Ground Cover.** The percentage of material, other than bare ground, covering the land surface. It may include live and standing dead vegetation, litter, cobble, gravel, stones and bedrock. Ground cover plus bare ground would total 100 percent (BLM Technical Reference 4400-4).

**Invasive.** Describes a species which takes over a new habitat where it was not previously found, often to the detriment of species which were there before.

**Invasive Species.** An alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

**Litter.** The uppermost layer of organic debris on the soil surface; essentially the freshly fallen or slightly decomposed vegetal material (BLM Technical Reference 4400-4).



**Marsh.** Flat, wet, treeless areas usually covered by standing water and supporting a native growth of grasses and grasslike plants.

**Mechanical Treatment.** Use of mechanical equipment for seeding, brush management, and other management practices.

**Noxious Weed.** Any plant designated by a federal, state, or county government as injurious to public health, agriculture, recreation, wildlife, or property.

**Nutrient, Plant.** Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil, and carbon, hydrogen, and oxygen obtained from the air and water.

**Old-growth.** A stage that constitutes the potential plant community, characterized by large, old trees, and capable of existing on a site given the frequency of natural disturbance events. Identification of old-growth species is dependant on the forest/woodland type. In most forest/woodland stands, old-growth tree species have large diameters relative to average, and are resilient and able to withstand natural disturbance events (i.e., fire).

**Overmature woodland.** A vegetation state whereby the woodland community has crossed a threshold into a state where the canopy cover exceeds optimum percentages and the herbaceous perennial understory has been reduced to rare or absent. In this state, tree density and fuel accumulation have reached the point of promoting large hot fires.

**Overstory.** The upper canopy or canopies of plants. Usually refers to trees, tall shrubs, and vines.

**Passive Restoration.** Vegetation treatments that rely primarily on modifications to the management of other resource uses. These treatments may include application of such tools and management changes as closure of allotments, elimination of herd management areas, modification in wild horse appropriate management levels, changes in livestock periods of use or stocking rates, changes in permitted animal-unit-months, conversion in type of livestock, changes in grazing systems, changes in wildlife management, restrictions on recreation and off-highway vehicle use, and changes in policies regarding harvest of woodland and native plant products.

**Passive Treatment.** Treatment technologies predominantly rely on modifications to existing management and uses without substantive new disturbances (e.g., changes in livestock grazing, wild horse management, recreational usage, biological weed control, etc. These treatments do not include mechanical methods, herbicides, or fire. Effects typically become apparent over an extended period of time of a few to many growing seasons.

**Phase.** A descriptor used to describe where a plant community exists within a particular state (e.g., declining herbaceous understory of the shrub/herbaceous state) of the state-and-transition model.



**Plant Cover.** 1) The plants or plant parts, living or dead, on the surface of the ground. Vegetative cover or herbage cover is composed of living plants and litter cover of dead parts of plants; 2) the area of ground cover by plants of one or more species.

**Proper Functioning Condition.** Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high waterflows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid floodplain development; improve flood-water retention and groundwater recharge; develop root masses that stabilized streambank against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity (BLM Technical Reference 1737-9).

**Range of Healthy Conditions (vegetation).** The set of primary vegetation community characteristics that determine whether a given vegetation community is considered to be “healthy” with respect to the agency goals of ecological health and resilience. Ranges of healthy conditions are based primarily on composition of perennial species present in the overstory vegetation and the presence or absence of native perennial species in the herbaceous understory.

**Resilience.** The ability of a natural vegetation community to recover following a disturbance such as fire with recruitment of native plants in a manner that eventually leads back to the pre-disturbance condition. Resilient communities typically exhibit perennial herbaceous understory; non-resilient communities commonly exhibit no understory or understories dominated by invasive exotic species.

**Riparian.** Referring to or relating to areas adjacent to water or influenced by free water associated with streams or rivers on geologic surfaces occupying the lowest position of a watershed. Pertaining to, living or situated on, the banks of rivers and streams. 'Xeroriparian' refers to being situated on dry washes (ephemeral streams).

**Seral Stage.** The developmental phase of a forest stand or rangeland with characteristic structure and plant species composition.

**Scrub.** Refers to a stand of vegetation characterized by thick growth of dwarf or stunted trees and shrubs and a poor soil.

**Shrub.** A low woody plant.

**Site Preparation.** Any action taken in conjunction with a reforest effort (natural or artificial) to create an environment that is favorable for survival of suitable vegetation during the first growing season. This environment can be created by altering ground cover, soil, or microsite conditions through using biological, mechanical, or manual clearing, prescribed burns, herbicides, or a combination of methods.

**Slash.** The branches, bark, treetops, reject logs, and broken or uprooted trees left on the ground after logging.



**State.** A descriptor used to describe where a plant community exists along the continuum of normal succession (e.g., shrub/herbaceous state for sagebrush communities) as used in state-and-transition theory.

**Vegetation Manipulation.** Alteration of present vegetation by using fire, plowing, or other means to manipulate natural succession trends.

**Weed.** A plant considered undesirable, unattractive, or troublesome, usually introduced and growing without intentional cultivation.

**Wetlands.** Areas characterized by soils that are usually saturated or ponded, i.e., hydric soils, that support mostly water-loving plants (hydrophytic plants).

**Wilding.** A plant growing uncultivated in the wild either as a native or an escape.

**Woodland.** A forest community occupied primarily by noncommercial species such as juniper, mountain mahogany, or aspen.

## WATER

**Aquifer.** A body of rock that is sufficiently permeable to conduct groundwater and to yield economically significant quantities of water to wells and springs.

**Beneficial Use.** Any of various uses of water in an area. Water may be for agricultural, domestic, or industrial use, fish spawning, recreation, wildlife habitat, or other uses.

**Channeled.** Refers to a drainage area in which natural meandering or repeated branching and convergence of a streambed have created deeply incised cuts, either active or abandoned, in alluvial material.

**Drainage, Surface.** Runoff, or surface flow of water, from an area.

**Drawdown.** The lowering of the water level in a well as a result of withdrawal; the reduction in head at a point caused by the withdrawal of water from an aquifer.

**Ephemeral Stream.** A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no continuous supply from melting snow or other source, and its channel is above the water table at all times.

**Flood Plain.** A nearly level alluvial plain that borders a stream and is subject to inundation under flood-stage conditions unless protected artificially. It is usually a constructional landform built of sediment deposited during overflow and lateral migration of the stream.



**Groundwater.** Subsurface water that is in the zone of saturation. The top surface of the groundwater is the "water table." Source of water for wells, seepage, springs.

**Gully.** A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

**Infiltration.** The flow of a fluid into a substance through pores or small openings. It connotes flow into a substance in contradistinction to the word percolation. The process by which water seeps into a soil, as influenced by soil texture, aspect, and vegetation cover.

**Infiltration Rate.** Maximum rate at which soil under specified conditions can absorb rain or shallow impounded water, expressed in quantity of water absorbed by the soil per unit of time, e.g., inches/hour.

**Interior Drainage.** Streams with no outlet to the sea.

**Intermittent Stream.** A stream, or reach of a stream, that flows for prolonged periods only when it receives groundwater discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

**Microsiemens Per Centimeter.** A unit of measure for specific or electrical conductivity of water. Higher values reflect greater levels of dissolved conductors (e.g., sodium, calcium, or magnesium salts).

**Percolation.** The flow of a liquid through a porous substance.

**Perennial Stream.** A stream in which water is present during all seasons of the year.

**Perennial Yield.** Water that is available in a shallow alluvial aquifer that can be withdrawn without creating substantial drawdown in the aquifer's water table.

**Pluvial Lake.** A lake formed during a period of exceptionally high rainfall (such as during a time of glacial advance during the Pleistocene epoch) and now either extinct or existing as a remnant, such as Lake Bonneville.

**Runoff.** The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called groundwater runoff or seepage flow from groundwater.

**Seep.** Wet areas, normally not flowing, arising from an underground water source.

**Specific Conductance.** A measurement that indicates the capacity of a sample of water to transmit an electrical current, which is associated with the concentration of ionized substances in the water.



**Spring.** Flowing water originating from an underground source.

**Stream Channel.** The hollow bed where a natural stream of surface water flows or may flow; the deepest or central part of the bed, formed by the main current and covered more or less continuously by water.

**Total Dissolved Solids.** Total amount of dissolved material, organic or inorganic, contained in a sample of water.

### WATERSHED

**Ecological Site Description - Ecological Site Inventory** is the BLM's approved and accepted rangeland vegetation/soil survey method based on current year's vegetation growth, and an Order 3 soil survey. The BLM follows the survey processes and techniques defined in the Natural Resources Conservation Service (NRCS) "National Range and Pasture Handbook", with some slight adaptations to BLM's needs.

In order to properly inventory, assess, and manage the conditions of rangelands they must be divided into basic units of study. On rangelands and some forest lands this is called an **ecological site**. An ecological site, according to the National Range and Pasture Handbook, is

*...a distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation....An ecological site is the product of all the environmental factors responsible for its development, and it has a set of key characteristics that are included in the ecological site description. Ecological sites have characteristic soils that have developed over time throughout the soil development process. The factors of soil development are parent material, climate, living organisms, topography or landscape position, and time. An ecological site has a characteristic hydrology, particularly infiltration and runoff that has developed over time. The development of the hydrology is influenced by development of the soil and plant community. An ecological site has evolved a characteristic plant community kind (cool season, warm season, grassland, shrub-grass, sedge meadow) and amount of vegetation. The development of the vegetation, the soil, and the hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species, or in total production.*

**Ecological Site.** The kind of land with a specific potential natural community and specific physical site characteristics, differing from other kinds of land in its ability to produce vegetation and to respond to management (BLM Manual 4400).

**Hydrologic Balance.** The balance between hydrological inputs (infiltration of incident precipitation, run-on) and hydrological outputs (run-off, deep drainage) for an ecological site.

**Hydrologic Subbasins.** See watershed.



**Hydrologic Unit.** A geographic area representing part or all of a surface drainage basin or distinct hydrologic feature.

**Restoration.** Holistic actions taken to modify an ecological system to achieve desired, healthy, and functioning conditions and processes. Generally refers to the process of enabling the system to resume its resiliency to disturbances.

**Site Potential.** A measure of resource availability based on interactions among soils, climate, hydrology, and vegetation.

**Watershed.** 1) A total area of land above a given point on a waterway that contributes runoff water to the flow at that point; 2) A major subdivision of a drainage basin.

### **WILD HORSES**

**Appropriate Management Level.** The optimum number of wild horses that provides a thriving natural ecological balance on the public range.

**Band.** A group of wild horses running together or a lone wild horse.

**Herd.** One or more wild horse bands using the same general area.

**Herd Area.** Herd Areas are limited to areas of the public lands identified as being habitat used by wild horses and burros at the time of the passage of the Wild Horse and Burro Act, as amended (16 U.S.C. 1331-1340). Herd Area boundaries may only be changed when it is determined that: 1) areas once listed as Herd Areas are later found to be used only by privately owned horses or burros, or 2) the Herd Area Boundary does not correctly portray where wild horses and burros were found in 1971.

**Herd Management Area.** Areas within Herd Areas that are designated for management of wild horses as one of the multiple uses, where the long term maintenance and management of wild horses can occur due to adequate resources.

**Herd Management Area Plan.** A plan that prescribes measures for the protection, management, and control of wild horses and their habitat on one or more herd management areas, in conformance with decisions made in approved management framework or resource management plans.

**Wild Horses.** Unbranded and unclaimed horses that use Public land as all or part of their habitat, or that have been removed from such land by an Authorized Officer but have not lost their status under Section 3 of the "Wild Free-Roaming Horse and Burro Act."



### WILDLIFE

**Connectivity.** A network of habitat patches linked by areas or corridors of like habitat; it affects how organisms can move through the landscape.

**Cover.** Any form of environmental protection that helps an animal stay alive (mainly shelter from weather and concealment from predators); any vegetation material that overlies the soil surface and protects it against erosion.

**Crucial/Key Habitat.** Wildlife habitat vital to the existence in a given area of a particular wildlife species (other than threatened or endangered species which have legally designated "critical habitat").

**Habitat Degradation.** The pattern of changes in vegetation and other habitat components that result in loss of food supplies, water sources, cover quality, or space for a wildlife species.

**Habitat Fragmentation.** The division of large contiguous blocks of wildlife habitat into isolated smaller parcels separated by distances great enough to discourage wildlife movement between parcels.

**Habitat management scales:**

Large scale = RMP planning area

Mid scale = Watershed

Fine scale = Allotment, project, portion of a watershed

**Lek.** An assembly area where birds, especially sage grouse, carry on display and courtship behavior.

**Thermal Cover.** Cover used by animals to protect them against weather.

**Umbrella.** A large-bodied wildlife species that has a large home range and broad requirements for habitats and resources; managing for an umbrella species is assumed to provide habitats and resources for other species.



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### **RMP Management Focus**

*The restoration and maintenance of healthy ecological systems within watersheds is a primary focus for the future management of the Ely District. Healthy ecological systems are geographically diverse and change over time. They are compatible with soil potential and are resilient to disturbance.*

*Resources and resource uses will be managed to restore or maintain ecological health. Certain resource management changes and active treatments may need to be implemented, in portions of watersheds, to accomplish this objective. Adaptive management will be pursued to avoid deteriorating conditions favoring invasive plants and catastrophic fires. Any projects will be implemented so as to result in a mosaic of vegetation within a watershed.*

*In the long term, natural disturbance (such as drought or fire) will occur and fewer treatments will be needed to maintain ecological health. The result will be a variety of vegetation phases within a watershed, which will provide diverse, healthy conditions for future generations.*



